OPERABLE UNIT 3

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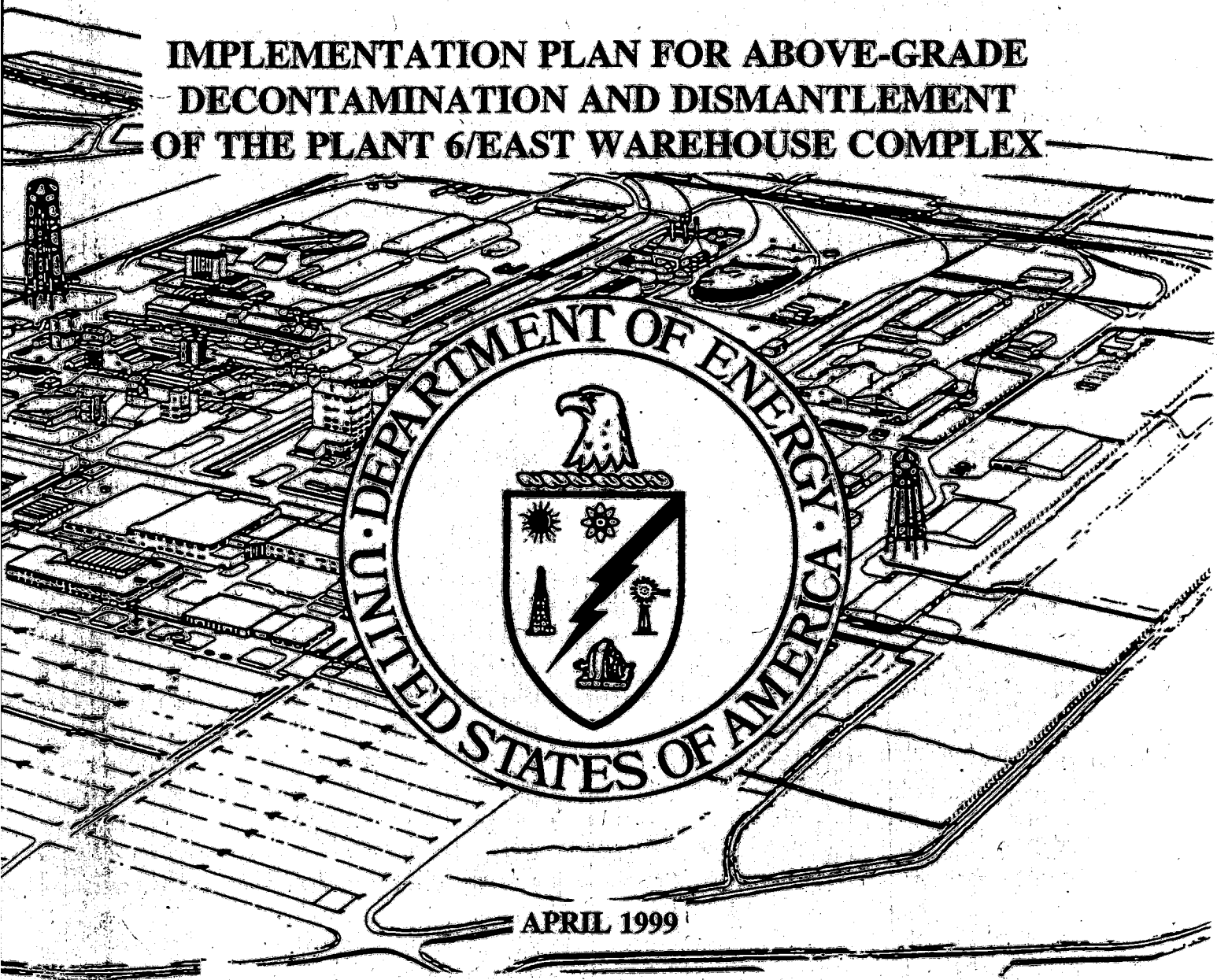
IMPLEMENTATION PLAN FOR ABOVE-GRADE DECONTAMINATION AND DISMANTLEMENT OF THE PLANT 6/EAST WAREHOUSE COMPLEX



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FERNALD, OHIO

U. S. DEPARTMENT OF ENERGY
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OPERABLE UNIT 3

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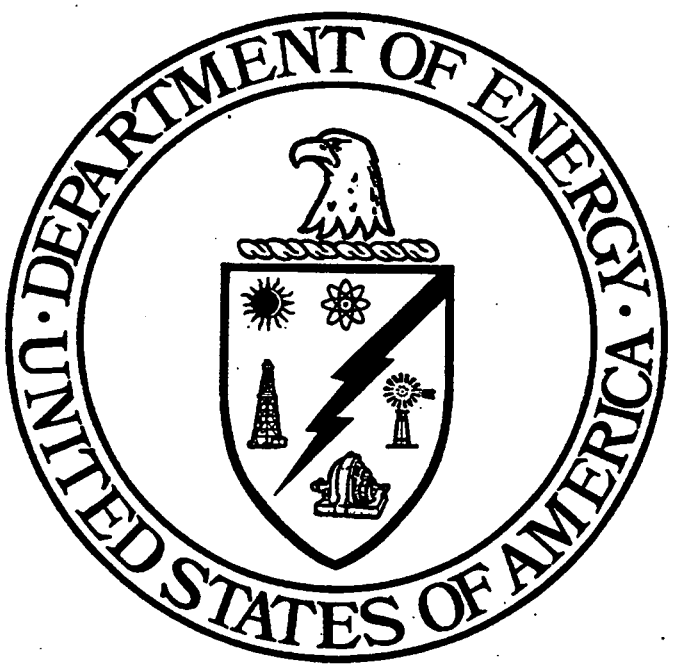

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CONTENTS

2203

TABLE OF CONTENTS i

LIST OF FIGURES ii

LIST OF TABLES ii

LIST OF APPENDICES ii

NOTATION iii

1.0 INTRODUCTION 1

1.1 Project Statement 1
1.2 Scope of Work 1
1.3 Plan Organization 3
1.4 Location of the Plant 6/EW Complex 3

2.0 GENERAL PROJECT REMEDIATION APPROACH 5

2.1 Sequencing of Remediation 5
2.2 Characterization of the Plant 6/EW Complex 5
2.3 Materials Management 10
2.3.1 Primary Materials Management 10
2.3.2 Secondary Waste Management 12
2.3.3 Estimates of Material Volumes 12
2.3.4 Material Handling, Storage, Treatment and Disposition 16
2.3.5 Material Recycling/Reuse 18
2.4 Environmental Monitoring 18
2.5 Remediation Activities 23
2.5.1 Preparatory Action: Inventory Removal 24
2.5.2 Preparatory Action: Facility/Safe Shutdown 24
2.5.3 Hazardous Waste Management Unit Decontamination 25
2.5.4 Asbestos Removal 25
2.5.5 Surface Decontamination 26
2.5.6 Above-Grade Dismantlement 27
2.6 Use of New Technologies 31

3.0 COMPONENT-SPECIFIC REMEDIATION 32

3.1 Building 6A - Metals Fabrication Plant 32
3.2 Building 6B - Plant 6 Covered Storage Area 40
3.3 Component 6C - Plant 6 Electrostatic Precipitator South 41
3.4 Component 6D - Plant 6 Electrostatic Precipitator Central 42
3.5 Component 6E - Plant 6 Electrostatic Precipitator North 42
3.6 Building 6F - Salt-Oil Heat Treatment Building 43
3.7 Building 6G - Plant 6 Sump Building 45
3.8 Building 77 - Finished Products Warehouse 46

4

3.9 Building 79 - Plant 6 Warehouse 47
3.10 Building 82A - Receiving/Incoming Materials Inspection 49
3.11 Component 20D - Elevated Potable Water Storage 50
3.12 Component G-008 - Pipe Bridges 50

4.0 SCHEDULE 52

5.0 MANAGEMENT 54

REFERENCES 56

FIGURES

FIGURE 1-1 Plant 6/EW Complex Project Area 4
FIGURE 2-1 FEMP Site Air Monitoring Locations 21
FIGURE 4-1 Plant 6/East Warehouse Complex Remediation Schedule 53

TABLES

TABLE 2-1 Radiological Contamination Survey Summary 6
TABLE 2-2 Plant 6/East Warehouse D&D Complex Asbestos Summary 8
TABLE 2-3 Plant 6/EW Complex Bulked Material Volume Estimates 13
TABLE 2-4 Plant 6/EW Complex Unbulked Material Volume Estimates 14
TABLE 2-5 Plant 6/EW Complex Material Weight Estimates 15
TABLE 3-1 Building 6A Inventory Material Removed 38
TABLE 3-2 Plant 6 Hold-up Material Quantities 38

LIST OF APPENDICES

APPENDIX A Proposed Sampling

APPENDIX B Evaluation of Material Disposition Alternatives

APPENDIX C Performance Specifications

APPENDIX D Design Drawings

APPENDIX E Photographs

2203

NOTATION

Abbreviations, Acronyms, and Initials

ACM	asbestos-containing material(s)
AMS	air monitoring station
ARP	Aquifer Restoration Project
AWWT	Advanced Waste Water Treatment System
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act, as amended
CMU	concrete masonry unit
DOE	United States Department of Energy
D&D	decontamination and dismantlement
EW	East Warehouse
FEMP	Fernald Environmental Management Project
HEPA	high-efficiency particulate air [filter]
HVAC	heating, ventilating, and air conditioning
IEMP	Integrated Environmental Monitoring Plan
IIMS	Integrated Information Management System
MEF	Material Evaluation Form
MSCC	Material Segregation and Containerization Criteria
NESHAPs	National Emissions Standards for Hazardous Air Pollutants
NPDES	National Pollutant Discharge Elimination System
NTP	Notice to Proceed
NTS	Nevada Test Site
Ohio EPA	Ohio Environmental Protection Agency
OU3	Operable Unit 3
PCB(s)	polychlorinated biphenyl(s)
PCDF	permitted commercial disposal facility
PPE	personal protective equipment
PWID	Project Waste Identification and Disposition [form]
RCRA	Resource Conservation and Recovery Act, as amended
RD/RA	remedial design/remedial action
RI/FS	remedial investigation/feasibility study
ROB	roll-off box
ROD	Record of Decision

Abbreviations, Acronyms, and Initials (Cont'd.)

SAP	Sampling and Analysis Plan
SWIFTS	Site-Wide Waste Information, Forecasting and Tracking System
U.S. EPA	United States Environmental Protection Agency
WAC	Waste Acceptance Criteria
WWTS	waste water treatment system

Units of Measure

cm.	centimeter(s)
cm^2	square centimeter(s)
dpm	disintegration(s) per minute
ft.	foot (feet)
ft^2	square foot (feet)
ft^3	cubic foot (feet)

Chemical Symbols

U	uranium
U-235	uranium-235

1.0 INTRODUCTION

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1.1 Project Statement

This implementation plan represents the combined remedial design documentation for both the Plant 6 Complex and the East Warehouse Complex, which were previously identified as separate design submittals in the Operable Unit 3 (OU3) Integrated Remedial Design/Remedial Action (RD/RA) Work Plan (DOE 1997a). These complexes were combined as part of a U.S. Department of Energy (DOE) initiative to accelerate OU3 remediation and reduce costs during design and implementation. This D&D project is being implemented pursuant to the authority stipulated in the OU3 Record of Decision for Final Remedial Action (OU3 Final ROD) (DOE 1996), which covers D&D and waste treatment and disposition.

The purpose of this document is to summarize the Plant 6/East Warehouse (EW) Complex D&D design in the format and content approved by the U.S. Environmental Protection Agency (U.S. EPA) and the Ohio Environmental Protection Agency (Ohio EPA) through the approval of the OU3 Integrated RD/RA Work Plan and previous above-grade D&D implementation plans. This document elaborates, as applicable, on programmatic strategies presented in the OU3 Integrated RD/RA Work Plan, above-grade D&D strategies developed for the Contractor's scope of work, and project specifications (contained in Appendix C of this document).

At- and below-grade remediation is not included within the scope of this project. The remedial design of the at- and below-grade portions of the Plant 6/EW Complex will be performed under the Soil Characterization and Excavation Project (SCEP) remedial design pursuant to the Operable Unit 5 Record of Decision (ROD).

1.2 Scope of Work

The above-grade Plant 6/EW Complex D&D project includes the following major activities:

- surface decontamination;
- above-grade component dismantlement; and
- material management.

8

Preparatory action: Inventory Removal and Facility/Safe Shutdown are not in the scope of this D&D project; however, the performance of these actions have been summarized in Sections 2 and 3. The following components are included in the Plant 6/EW Complex:

- Building 6A: Metals Fabrication Plant;
- Building 6B: Plant 6 Covered Storage Area;
- Component 6C: Plant 6 Electrostatic Precipitator South;
- Component 6D: Plant 6 Electrostatic Precipitator Central;
- Component 6E: Plant 6 Electrostatic Precipitator North;
- Building 6F: Salt-Oil Heat Treatment Building;
- Building 6G: Plant 6 Sump Building;
- Component 20D: Elevated Potable Water Storage;
- Building 77: Finished Products Warehouse;
- Building 79: Plant 6 Warehouse;
- Building 82A: Receiving/Incoming Materials Inspection;
- Building 63: KC-2 Warehouse; and
- Component G-008: Pipe Bridges.

Building 63, the KC-2 Warehouse, is mentioned in this plan in the event it is not demolished under the Miscellaneous Small Structures Implementation Plan (MSS) (DOE, September 1998). The MSS Implementation Plan contains the Building 63 specific remediation tasks (Section 3.23), building location (Figure 1-1, page 4), and building drawings (Appendix D; D-22 Floor Plan, D-23 Elevation Views). Additional photographs of Building 63 are found in Appendix E of this document.

Requirements for above-grade D&D of the Plant 6/EW Complex were developed using the performance specifications that were originally included in Appendix B of the OU3 Integrated RD/RA Work Plan. Appendix C of this Implementation Plan contains project-specific applications of these performance specifications.

DOE will provide notification to the regulatory agencies of any significant changes to the design prior to implementation. Should the regulatory agencies have any concerns regarding any significant design change, DOE will properly address those concerns as soon as practicable and, if necessary, perform one or more of the following: amend the implementation plan, amend the OU3 Integrated RD/RA Work Plan, present an explanation of significant difference to the OU3 ROD, and/or amend the RODs. Significant changes to the design are those that require formal design modification which would impact the implementation strategies presented in this document. If necessary, affected activities may be suspended until the

revision has been completed and approved. This course of action adheres to the commitments made in Section 4.2.2 of the OU3 Integrated RD/RA Work Plan for design changes.

P 2203

1.3 Plan Organization

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This implementation plan is comprised of five sections and five appendices. Section 1 contains the remedial action project statement, scope of work, an overview of this implementation plan, and a brief description of the Plant 6/EW Complex. Section 2 describes the overall approach to implementing this above-grade D&D project, as applied from the OU3 Integrated RD/RA Work Plan. That approach includes the projected sequence for remediation of components, a plan for materials management, environmental monitoring activities, and the project-specific applications of implementation strategies for above-grade remediation. Section 3 presents pertinent component history and applicable component-specific details of the applicable remedial tasks. Section 4 presents the schedule for remediation and project reporting. Section 5 describes the subcontract strategy and FEMP project management approach.

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Appendix A contains a discussion of potential environmental and occupational sampling for this project, based on the assumptions in the Sampling and Analysis Plan (SAP) contained in Appendix D of the OU3 Integrated RD/RA Work Plan, and on the remediation requirements presented in this plan. Appendix B provides a summary of the evaluation of material disposition alternatives for accessible metals and a tabulation of the cost comparison between the disposition alternatives. Appendix C provides the project performance specifications. Appendix D provides copies of available drawings which show floor plans and elevations of components. Appendix E contains selected photographs of notable features of the Plant 6/EW Complex.

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1.4 Location of the Plant 6/EW Complex

The Plant 6/EW Complex project site is located at the U.S. Department of Energy (DOE) Fernald Environmental Management Project (FEMP) in Fernald, Ohio. The components included in the Plant 6/EW Complex above-grade D&D project include most of the structures located within the block bordered by 1st and 2nd Streets and "D" Street and "F" Street of the former production area. These components are shown in Figure 1-1.

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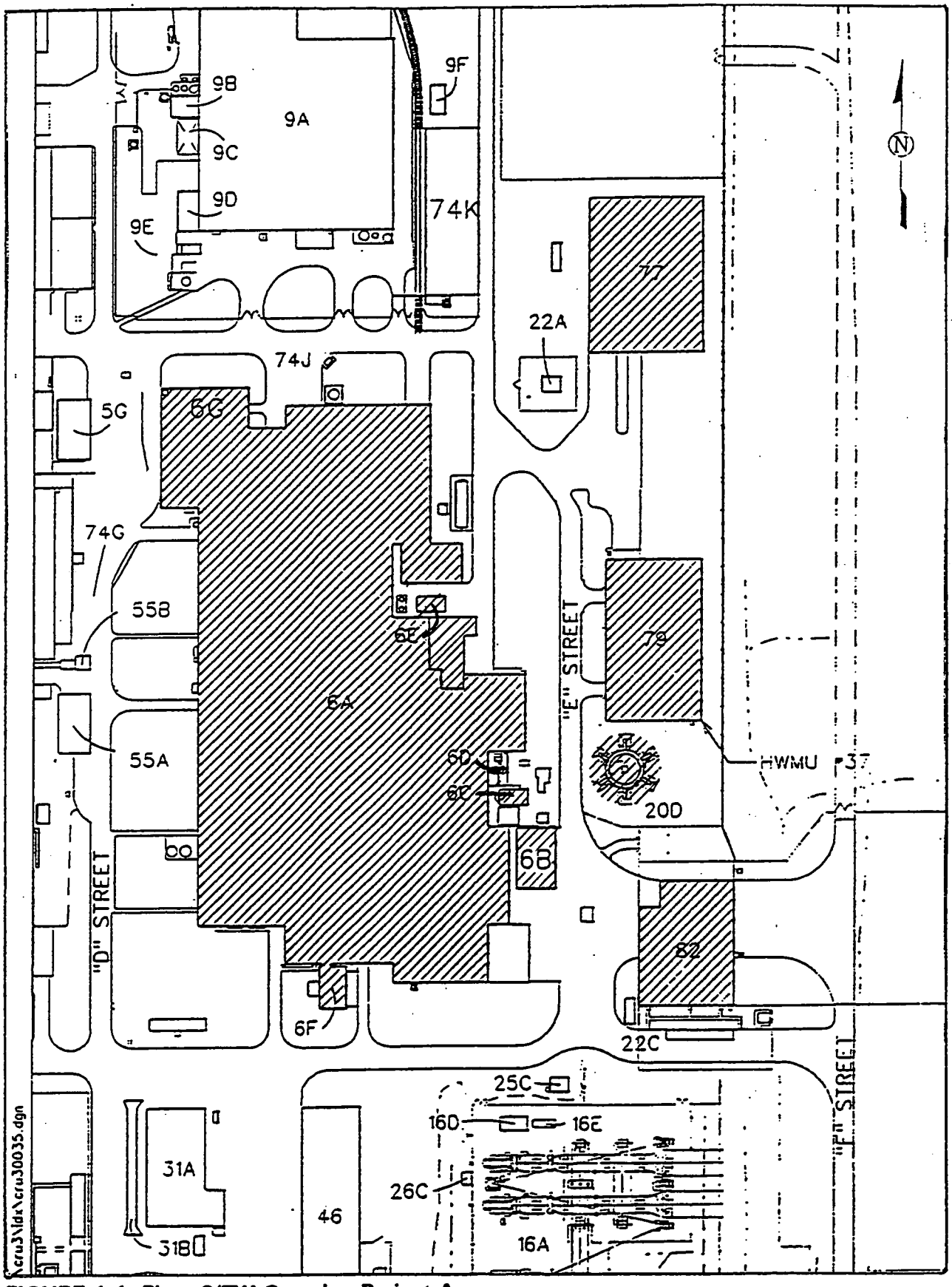

FIGURE 1-1 Plant 6/EW Complex Project Area

2.0 GENERAL PROJECT REMEDIATION APPROACH

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The overall approach to the above-grade D&D of the Plant 6/EW Complex includes the applicable programmatic elements and tasks that were described in Section 3 of the OU3 Integrated RD/RA Work Plan. Section 2 of this implementation plan summarizes the project-specific applications of those elements.

2.1 Sequencing of Remediation

The remediation sequence for components in the Plant 6/EW Complex D&D project includes a period of 1) Notice to Proceed (NTP); 2) premobilization, when Contractor Safe Work Plans, health and safety documents, etc., are prepared and approved; 3) mobilization, which includes establishing project support facilities and controls; 4) D&D field activities for each component ; and 5) demobilization, securing the area and decontaminating/removing Contractor equipment. The actual sequence of component D&D will be determined by the Contractor's project schedule, subject to FEMP Project Management approval. It is anticipated that the Plant 6 outlying components (i.e., 6B, 6C, 6D, 6E, 6F, 6G and G-008) will be decontaminated and dismantled concurrent with Building 6A; however, final structural dismantlement of Building 6A would likely be the last in the sequence.

Components 20D, 77, 79, 82A, and pipe bridges are included in the scope of the D&D contract to accelerate the dismantlement of these structures. These components are expected to be used for Waste Management operations until approximately the Fall of 2001. If these components are not exercised in the combined Plant 6/EW Complex, they will be proposed to be included in a separate D&D Complex project.

2.2 Characterization of the Plant 6/EW Complex

Historical and recent radiological surveys were obtained to substantiate this information and have been summarized in Table 2-1.

12

TABLE 2-1 Radiological Contamination Survey Summary

Building or Component	Removable Range	Fixed Plus Removable Range
Bldg. 6A Metals Fabrication (General)	<MDCR - 414K	<MDCR - 2.6M
Bldg. 6A (Thorium Furnace Area)	10K - 22K	600K - 6M
Bldg. 6B Covered Storage Area	<MDCR - 1.2K	Not Available
Bldg. 6C Precipitator (South)	400 - 2K	45K - 900K
Bldg. 6D Precipitator (Central)	<MDCR - 24K	60K - 450K
Bldg. 6E Precipitator (North)	800 - 6K	45K - 600K
Bldg. 6F Salt Oil Heat Treatment	294 - 193K	10K - 1.09M
Bldg. 6G Sump Bldg.	<MDCR	3K - 9K
Component 20D Elevated Tank	<MDCR	<MDCR - 30K
Bldg. 63 KC-2 Warehouse	<MDCR	<MDCR - 30K
Bldg. 82A Receiving Warehouse	<MDCR	<MDCR
Bldg. 77 Finished Products	<MDCR	Not Available
Bldg. 79 Plant 6 Warehouse	<MDCR	<MDCR

NOTES:

- <MDCR indicates activity is below the minimum detectable count rate of the counting instrument.

1. The values provided are typical ranges of contamination levels existing in each facility. The values are representative of general floor areas, walls, structural components, and exterior surfaces of equipment. Higher contamination levels should be expected within process equipment internals, sumps, and facility overheads.

2. Updated surveys are available at the Contractor's request prior to commencement of demolition activities.

3. Fixed contamination values for Bldgs. 77 and 79 are not currently available due to elevated background caused by storage of drummed radioactive material in the buildings. Updated surveys will be provided when background levels allow determination.

4. For all facilities with the exception of the thorium furnace area in plant 6, the isotope of concern is U-238 and all values are beta-gamma readings in units of dpm/100cm^2. For the thorium furnace area in plant 6, the isotope of concern is Th-232 and the values are alpha readings in units of dpm/100cm^2.

5. Data provided for Bldg. 6A process equipment does not constitute all of the equipment in the building. It is solely intended to provide a representative sampling of typical levels of contamination that may be expected for accessible surfaces of process equipment. Higher levels of contamination should be expected as inaccessible areas are exposed during dismantlement.

2203

A review of the relevant analytical evaluation data generated from material take-off estimates performed during design, revealed that Building 6A contains approximately two tons of lead flashing that is considered potentially mixed waste. Additionally, the OU3 RI/FS identified that process piping and equipment exists in several of the components associated with processes in Plant 6. The material take-off estimates also identified approximately 100 tons of acid brick. Lead flashing, process-related metals, and acid brick are prohibited from disposal in the On-Site Disposal Facility (OSDF) and, as a result, will be segregated and containerized for off-site disposal. Other materials to be generated from the Plant 6/EW components are considered low-level radiological waste that may be disposed in the OSDF provided that other physical OSDF Waste Acceptance Criteria (WAC) are met.

The most significant concerns arising from the review of component characterization data are the health and safety of the workers during dismantlement of equipment/systems and other miscellaneous materials in Building 6A. The presence of radiological contamination justifies at least best available technology to prevent or minimize generation of airborne dusts. Specific uses of the characterization data summarized in Table 2-1 during the remedial design includes support for the following design efforts:

- develop the safety assessment documentation to support the proposed activities;
- enhance the project-specific health and safety requirements and determine potential concerns for worker protection based on the suggested decontamination and dismantlement techniques;
- documentation of expected contamination levels for the Contractor;
- determine personnel monitoring requirements;
- identify specific areas, systems, or equipment which will require radiological engineered controls prior to dismantlement;
- air modeling and assessment of potential radiological air emissions; and,
- identifying potential gross radiological contamination that will need to be decontaminated prior to exposing affected material surfaces to the environment.

The Plant 6/EW Complex was evaluated by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist for asbestos containing materials (ACM) and the results are summarized in Table 2-2.

TABLE 2-2 Plant 6/EW D&D Complex Asbestos Summary

BUILDING #	ASBESTOS MATERIAL	LOCATION	ASBESTOS CONTENT
6A	Pipe Fitting Insulation	Throughout building (inside and outside)	3-90% Chry 5-85% Amo 5-25% Crocidolite
6A	Pipe Insulation	Throughout building (inside and outside)	5-90% Chry 5-90% Amo 5-25% Crocidolite.
6A	Condensate Tank / Exchanger	Rolling Mill area	10-30% Chry. 50% Amo.
6A	Waste Water Tank Insulation	Northeast (outside building)	10-20% Chrysotile
6A	Nitric Acid Tank Insulation	East (outside building)	5-20% Chrysotile
6A	Transite	Interior walls & interior roof panels	20-30% Chrysotile
6A	Transite	Exterior walls & roof	20-30% Chrysotile
6A	Transite (deteriorated)	Scrap pickling	20-85% Chrysotile
6A	Transite ceiling panels	Throughout electrical equipment room	20-30% Chrysotile
6A	Transite	Inside electrical breaker panels	20-30% Chrysotile
6A	Gasketry	Throughout	3-85% Chrysotile
6A	Floor Tile	Offices and breakrooms	10-15% Chrysotile
6A	Floor Tile Mastic	Offices and breakrooms	5-10% Chrysotile
6A	Fabric / Rope	Mach. Shop Sump Pit	70% Chrysotile
6A	Fire Retardant Clothing	Rolling Mill	60-70% Chrysotile
6A	Gutter debris	Exterior	>1% Chrysotile
6A	Switchgear panel boards	Throughout electrical equipment room	30-40% Chrysotile
6A	Built-up roofing	Southeast roof (columns 22 to 30) and east roof (columns 11 to 18)	10-20% Chrysotile 1-3% Amosite
6A	Woven cloth insulation on electric wiring	Throughout building	Assume ACM
6A	Fire rated doors	Throughout building	Assume ACM
20D	Pipe insulation	Center standpipe	20-30% Chrysotile
20D	Transite	Control house	20-30% Chrysotile

The asbestos evaluation also revealed the following information: P. 2203

- Pipe or tank insulation covered with an embossed metal jacket can be considered non-asbestos containing. Any pipe or tank insulation covered with a smooth or corrugated metal jacket should be presumed to be ACM unless labeled as "Asbestos Free".

- The transite wall board and roof panels inside the Scrap Picking area are deteriorated due to extended exposure to nitric acid and high humidity. The deteriorated transite in this area shall be abated as friable asbestos.

- The large waste water tank located northeast of Plant 6 (outside) has been sampled to determine asbestos content. The end caps of the tank do contain asbestos, while the cylinder portion of the tank is covered with a foam block (non-asbestos) insulation.

- The storage tank located at the north end of Plant 6 has a corrugated metal jacket which has partially been removed. Visual inspection of the insulation on this tank confirms the insulation is mineral wool. The insulation on this tank can be treated as non-asbestos insulation.

- Drawings of the equalizing furnace indicate there is insulating block present beneath the fire brick. This block could not be accessed to be sampled, so insulating block shall be assumed to be friable ACM. The salt bath furnace is similar in construction to the equalizing furnace, so it should be presumed a layer of ACM insulating block is also present in the salt bath furnace.

- Drawings of the old ingot furnace stack indicate there is a layer of refractory cement present between the fire brick and the outer wall of the stack. This cement could not be accessed to be sampled, so this layer of cement should be assumed to be friable ACM.

- The free-standing panel boards located throughout the west Electrical Equipment Room shall be treated as non-friable ACM.

- Ceiling tiles in the office areas in Plant 6 have been sampled and do not contain asbestos. Due to the year of construction, any pipe, duct or tank insulation inside the new Water Treatment area of Plant 6 can be considered asbestos free.

- Buildings 77, 79 and 82A were inspected by a State of Ohio-Certified Asbestos Hazard Evaluation Specialist and can be considered asbestos free.

- The large center standpipe on the East Elevated Water Tower (20D) is insulated with foam block covered with a layer of asbestos containing asphalt mastic and metal jacket.

- Ceiling tiles in the office areas in Plant 6 have been sampled and do not contain asbestos.

- Due to the year of construction, any pipe, duct or tank insulation inside the new Water Treatment Area of Plant 6 can be considered asbestos free.

2.3 Materials Management

Project-specific material management strategies for the Plant 6/EW Complex D&D project are based on the overall material management strategies, which were presented in Section 3.3 of the OU3 Integrated RD/RA Work Plan, and the project-specific requirements presented in Specification Section 01120. Management of primary and secondary waste materials estimated to be generated during the Plant 6/EW Complex D&D project is discussed in this section.

Waste minimization will be accomplished, in part, by ensuring that equipment and material are unpacked prior to entering the FEMP controlled area whenever possible. This administrative control will limit the amount of trash that could become contaminated and limit quantities of any hazardous material brought into the project area.

2.3.1 Primary Materials Management

Primary materials refer to the debris that will be generated by the dismantlement of the components and structures in the Plant 6/EW Complex. During the remedial design, a Project Waste Identification and Disposition form (PWID — see Section 3.3.1 of the OU3 Integrated RD/RA Work Plan for description) was developed which identifies all debris to be generated, quantities, characterization, container requirements, and disposition location. All debris types have been characterized and documented in a Material Evaluation Form (MEF). To supply the Contractor with the sizing, segregation, and containerization requirements outlined in the OU3 Integrated RD/RA Work Plan, a Material Segregation and Containerization Criteria form (MSCC — see Section 3.3.1 and Appendix A of the work plan for description and example,

respectively) was developed.

L- 2203

Pursuant to DOE's commitment to evaluating potential opportunities for recycle/reuse, as described in Section 3.3.6.1 of the OU3 Integrated RD/RA Work Plan, an evaluation of material disposition alternatives for accessible metals was performed and a summary of the results is presented in Appendix B.

Specification Section 01120 identifies debris/waste handling requirements for the Contractor. Debris handling requirements are defined by the following classifications: 1) non-process debris; 2) process debris; and 3) suspect process debris. Details regarding the handling of each of these types of debris are described in Article 3.2 of Specification Section 01120. All debris is required to be sized, segregated, and containerized in accordance with the MSCC. To ensure that debris which is destined for disposal in the OSDF meets the OSDF waste acceptance criteria (WAC), the MSCC identifies specific materials from the project that are known to either meet or not meet WAC. When debris is generated, a representative from the OSDF Waste Acceptance Organization will ensure that the debris is segregated according to the proper debris categories identified on the MSCC, with specific oversight on the debris being containerized for the OSDF.

One decision that will be made before and during debris generation is whether or not certain debris contains *visible process residues*. The definition of visible process residues (green salt, yellow cake, black oxide, etc.) is hold-up/materials on the interior or exterior surfaces of debris that is obvious and that if rubbed, would be easily removed. Dirt, oil, grease, stains, rust, corrosion, and flaking do NOT qualify as visible process residues; however, dirt, oil, grease, stains, rust, corrosion, and flaking require decontamination for radiological control purposes prior to removing the debris from the enclosure or prior to opening a building to the environment per Specification Section 01517. Regardless of whether or not visible process residues are present, all debris is still considered to be radiologically contaminated unless otherwise specifically identified. Final visual inspection will take place following dismantlement, sizing, and sealing of openings in accordance with Specification Section 15065, decontamination in accordance with Article 3.1 of Specification Section 01517, and relocation to an approved inspection staging area.

18

2.3.2 Secondary Waste Management

Management of secondary wastes includes handling, sampling, storage, and disposition of secondary waste materials generated during remediation. Secondary waste includes vacuumed dust, filters, filter cake, personal protective equipment (PPE), spent consumables, and washwaters.

Depending on the DOE-approved methods for equipment/systems dismantlement, it is possible that up to 75,000 gallons of decontamination washwaters may be generated during the D&D of Plant 6/EW components and release cleaning of Contractor equipment. Since decontamination methods include non-water wash techniques (e.g., encapsulation), the projected volume of washwater is only a liberal estimate based on previous OU3 D&D projects that used high pressure, low volume water spray. Wastewater will be managed in accordance with the strategies laid out in the OU3 Integrated RD/RA Work Plan. The wastewater collection system will include use of portable collection devices such as a polyethylene-lined containment structure over which equipment is washed, filtering using two stage filters (20 micron prefilter and 5 micron filter to remove entrained particulate during transfer into a holding tank), sampling and analysis of water and sludges for constituents of concern (see Section 2.4 for wastewater monitoring), discharge of approved effluent into the FEMP wastewater treatment system (Advanced Wastewater Treatment Facility), and sludge removal and containerization in 55-gallon drums. The need for washwater sampling is determined by the Wastewater Treatment System (WWTS) Manager if significant levels of constituents of concern are present, based on OU3 RI/FS analytical data. Section 2.4 further discusses wastewater monitoring strategies. The ultimate disposition of wastewater into the WWTS is managed in accordance with existing site procedure EP-005 "Controlling Aqueous Wastewater Discharges into Wastewater Treatment Systems".

2.3.3 Estimates of Material Volumes

Materials to be generated during this project have been categorized according to the same classification system that was developed for and described in the OU3 RI/FS Report (1996a), and OU3 Integrated RD/RA Work Plan, and are estimated in Tables 2-3, 2-4, and 2-5.

TABLE 2-3 Plant 6/EW Complex Bulked Material Estimates (yd^3)

Component Designation	Categ. A Accessible Metals	Categ. B Inaccessible Metals	Categ. C Process Related Metals	Categ. D Painted Light-Gauge Metals	Categ. E Concrete	Categ. F Brick	Categ. G Non-Regulated ACM	Categ. H Regulated ACM[1]	Categ. I Misc. Materials [2]	Component/ Complex Totals
6A	2,812.2	8,843.4	200	2,132.6	227.1	100.7	708.5	708.2	621.6	16,154.55
6B	20.2	3.3	0	6.7	0	0	0	0	0	30.2
6C	1.2	2.2	0	6.2	0	0	0	0	0	9.6
6D	6.8	39.7	0	86.9	0	0	0	1.9	0	135.3
6E	1.2	2.2	20	7.2	0	0	0	0	0	10.6
6F	1.5	65.2	20	12.3	0	0	0	0	0	79.0
6G	185.9	318.7	0	39.6	9.8	0	0	1.5	196.4	751.9
20D	175.5	125.4	0	0	0	0	0	29.3	0	330.2
63	150.8	86.4	0	73.0	13,936	0	0	0	293.9	14,540.1
77	68.8	42.3	0	85.4	0	0	0	0	0	196.5
79	66.8	56.7	0	76.6	0	0	0	0	0	200.1
82A	58.8	54.0	0	59.4	121.6	0	0	0	48.4	342.2
G-008	140.1	36.3	0	0	0	0	0	81.7	0	258.1
Complex Total	3,689.8	9,675.8	0	2,585.9	14294.5	100.7	708.5	822.6	1,160.3	33,038.1
Container/ Quantity	ROB[4] /123	ROB/323	TL[4]/0	ROB/86	ROB/953	n/a	Pallets/236	ISO[4]/2723	ROB/39	
Interim Storage Config	OSDF Transfer[4]	OSDF Transfer	TL/ Plt. 1 Pad	OSDF Transfer	OSDF Transfer	n/a	OSDF Transfer	ISO/ Plt.1 Pad	OSDF Transfer	
Disposition	OSDF	OSDF	Offsite:NTS	OSDF	OSDF	n/a	OSDF	OSDF	OSDF	

Footnotes:

(1) Excludes gutter cleanout which will be placed in drums.

(2) Excludes compactibles which will be placed in dumpster for compaction. Miscellaneous materials can be containerized with non-regulated asbestos containing material (ACM).

(3) ROB: Roll-Off Box holds 30 cubic yards (810 cubic feet) and/or 16.95 tons of material; TL: Top-Loading (also referred to as a Large White Metal Box) holds 35.9 cubic yards (970 cubic feet) and or 18 tons of material; ISO: End-Loading Container/Sea Land boxes, holds up to 36 cubic yards (971 cubic feet) and/or 42,000 lbs. of material.

(4) OSDF Transfer: On-site Disposal Facility Transfer area. Refers to direct disposal in the OSDF; however, the ability to deliver debris directly to the OSDF Transfer Area is dependent on whether the OSDF is accepting debris and/or availability of containers (ROBs) for transport. If necessary, Category A, B, D, and E debris may be temporarily stockpiled on the Plant 5 Pad at project completion.

(5) If debris can not be decontaminated to meet visible process residue criteria then off-site disposal will be necessary.

TABLE 2-4 Plant 6/EW Complex Unbulked[1] Material Estimates (yd^3)

Component Designation	Accessible Metals	Inaccessible Metals	Process Related Metals	Painted Light-Gauge Metals	Concrete	Brick	Non-Regulated ACM	Regulated ACM	Misc. Materials	Component/ Complex Totals
6A	1,406.1	4,231.1	100	4,093	151.4	67.1	590.4	472.2	230.9	11,242.2
6B	10.1	1.0	0	0.2	0	0	0	0	0	11.3
6C	0.6	1.1	0	0.1	0	0	0	0	0	1.8
6D	3.4	19.8	0	173.7	0	0	0	1.3	0	198.2
6E	0.6	1.1	0	2.1	0	0	0	0	0	3.8
6F	0.7	32.5	0	2.4	0	0	0	0	0	35.6
6G	93.0	130.5	0	1.7	6.5	0	0	1.0	78.6	311.3
20D	87.7	58.6	0	0	0	0	0	19.5	0	165.8
63	75.4	18.8	0	3.6	9,290.5	0	0	0	117.6	9,505.9
77	34.4	15.9	0	3.7	0	0	0	0	0	54.0
79	33.4	20.8	0	3.6	0	0	0	0	0	57.8
82A	29.4	24.1	0	84.1	81.1	0	0	0	19.6	238.3
G-008	70.1	9.1	0	0	0	0	0	43.5	0	122.7
Complex Total	1,844.9	4,564.4	0	4,368.2	9,529.5	67.1	590.4	537.5	446.7	21,948.7

NOTE: "Unbulked" refers to "As-built" volumes.

TABLE 2-5 Plant 6/EW Complex Material Weight Estimates (Tons)

Component Designation	Accessible Metals	Inaccessible Metals	Process Related Metals	Painted Light-Gauge Metals	Concrete	Brick	Non-Regulated ACM	Regulated ACM	Misc. Materials	Component/ Complex Totals
6A	1,139	3,261.9	81	71.5	250.2	108.8	597.6	77.8	106.2	5,613
6B	8.2	0.73	0	1.1	0	0	0	0	0	10.0
6C	0.5	0.65	0	1.0	0	0	0	0	0	2.2
6D	2.8	15.7	0	2.5	0	0	0	0.2	0	21.2
6E	0.5	0.65	0	1.1	0	0	0	0	0	2.3
6F	0.6	25.5	0	1.8	0	0	0	0	0	27.9
6G	75.3	118.5	0	6.2	13.2	0	0	0.1	2.7	216
20D	71.1	48.6	0	0	0	0	0	2.9	0	122.6
63	61.1	10.8	0	11.2	18,813	0	0	0	14.1	18,910
77	27.9	9.7	0	13.4	0	0	0	0	0	51.0
79	27.0	14.0	0	11.8	0	0	0	0	0	52.8
82A	23.8	10.6	0	118.6	109.4	0	0	0	1.0	263.4
G-008	56.8	10.7	0	0	0	0	0	6.4	0	73.9
Complex Total	1,495	3,528	0	240.2	19,186	108.8	597.6	87.4	124	25,367

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2203

2.3.4 Material Handling, Storage, Treatment, and Disposition

Materials generated from the D&D of the Plant 6/EW Complex will be reduced in size, segregated, and containerized and/or staged/stockpiled in accordance with the requirements identified in the MSCC form supplied to the Contractor. Quantities and disposition of specific material categories were documented in the PWID form for internal use. Tables 2-3, 2-4, and 2-5 summarize the MSCC and PWID by identifying quantities, containerization, staging/interim storage, and disposal requirements for each category of material. Debris size requirements are described in Sections 3.3.2.1 and 3.3.6.2 of the OU3 Integrated RD/RA Work Plan.

As stated in Section 3.3.2.2 of the OU3 Integrated RD/RA Work Plan, materials will be identified according to the OU3 debris categories identified in the MSCC. The MSCC for the Plant 6/EW Complex allows for commingling of OU3 debris categories A, B, D, and incidental E into a single Roll-Off Box (ROB) since each of these material types conform to OSDF Impacted Material Category 2. The majority of Debris Category E (concrete), however, will be placed in separate ROBs. Commingling of OU3 debris categories A, B, D, and incidental E is being done to conform to the OSDF impacted material categories in order to facilitate placement. By allowing the commingling of these types of debris into the same ROB, there will be more efficient use of a limited number of ROBs at the FEMP. Materials will be containerized inside the project boundaries adjacent to structures being dismantled. It is currently planned that filled containers will be covered/sealed, screened for exterior radiological contamination, inspected, tagged, and transported directly to the OSDF Transfer Area. Should any materials be encountered that do not meet the OSDF waste acceptance criteria (e.g., materials with "visible process residues" such as yellow cake, black oxide, green salt, etc.) as defined in Specification Section 01120, they will be containerized separately from OSDF-bound materials. These materials will follow the same load-out and transportation procedures, and be packaged for off-site disposal at either the Plant 1 Storage Pad or a material packaging area that would be established within the project boundaries.

The current project strategy for managing debris is to deliver containerized debris directly to the OSDF Transfer Area; however, stockpiling of Category A, B, D and E debris for interim storage is a possibility due to the limited number of ROBs at the FEMP. Stockpiling of debris, if utilized, will follow the strategies provided under Section 3.3.2.3 of the OU3 Integrated

RD/RA Work Plan, which requires best available storage configuration for OU3 Debris Categories A, B, D, and E. The strategy for stockpiling also requires removing or encapsulation of contaminants. Specification Section 01517 debris release criteria requires that gross contamination be removed or encapsulated on debris surfaces prior to their removal from a building enclosure or local containment. To the maximum extent practicable, debris will be containerized following sizing when sufficient containers are available. Should the best available storage configuration (i.e., containers with lids or tarps) be temporarily unavailable, stockpiling of debris that meet the release criteria would be performed (as done on previous D&D projects at the FEMP). Based on current estimates for OSDF debris transfers and the schedules for completion of Plant 6/EW Complex D&D and start of Area 4A soil excavation, debris stockpiles may remain on the Plant 6 pad or along "D" and "E" Streets, where run-off controls would be established, for up to one year.

Material tracking and reporting will be accomplished by including a project-specific Site-Wide Waste Information, Forecasting and Tracking System/Integrated Information Management System (SWIFTS/IIMS) summary in the Project Completion Report. Section 3.3.2.2 (Segregation, Containerization, Tracking) of the OU3 Integrated RD/RA Work Plan describes material tracking and reporting using SWIFTS. OU3 Debris Categories A, B, D, and E debris are classified as OSDF Category 2 material. Therefore, commingled Debris Categories A, B, D, and E quantities will be tracked in SWIFTS/IIMS under a discreet Material Evaluation Form that corresponds to Impacted OSDF Category 2 debris in interim storage. OU3 Debris Category I (Miscellaneous Materials) is also OSDF Category 2 but will not be commingled and therefore actual volumes will be easily obtained. Debris Category G (Transite) and Debris Category H (Regulated ACM) are regarded as OSDF Categories 3 and 5, respectively, and will also be handled separately. Since the volume of commingled debris will represent a combination of waste streams, proportions of OU3 debris categories within that total volume will be derived based on original estimates to identify and track waste volumes by OU3 debris category. These derived quantities will be documented in the Project Completion Report for the Plant 6/EW Complex. Other than debris tracking more specifically for the purpose of OSDF placement, project-specific material tracking and reporting strategies for the Plant 6/EW Complex project do not differ from the strategies laid out in the OU3 Integrated RD/RA Work Plan and therefore no additional details were developed during the remedial design process.

The disposition strategy for the Plant 6/EW Complex materials is consistent with the requirements stated in the OU3 Final Action ROD (1996b) and strategies presented in the OU3 Integrated RD/RA Work Plan. Table 2-3 identifies that debris generated from this project will be placed in the OSDF. No treatment will be necessary for those materials destined for on-site disposal since all chemical-based waste acceptance criteria are met based on OU3 RI/FS data.

2.3.5 Material Recycling/Reuse

Accessible metals (Category A) from the Plant 6/EW Complex have been evaluated for potential recycling options and a detailed summary of that evaluation is available in Appendix B. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), 1,495 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Plant 6/EW Complex components were evaluated by comparing the four leading alternatives to on-site disposal. Of the three phases of the Decision Methodology (Threshold Phase, Life Cycle Analysis Phase, and Decision Phase), only the first phase was applied since the comparative evaluation of project costs for each alternative showed that the total costs for each of the recycling options greatly exceed the 25 percent total cost criteria compared to the OSDF.

2.4 Environmental Monitoring

Project-specific environmental monitoring will only include wastewater monitoring. Environmental radiological air monitoring will consist of the FEMP site-wide air monitoring data from upwind and downwind air monitors to ensure that the site continues to meet applicable standards; supplemental environmental radiological air monitoring was determined to not be warranted for this project given the estimated low uranium air emissions found through contaminant release modeling. Groundwater monitoring is not needed to support this project.

Project-specific stormwater management is governed by the FEMP Stormwater Pollution Prevention Plan (DOE 1996c) and any monitoring associated with that program is managed by OU5/Aquifer Restoration Project. Project-specific stormwater management includes the diversion of stormwater to appropriate site collection drains surrounding the project.

2203

Surface Water (Wastewater) Monitoring

Section 2.3.2 of this Implementation Plan describes the wastewater management strategies that will be employed for the Plant 6/EW Complex. The OU3 Integrated RD/RA Work Plan describes the overall strategies to be implemented for project monitoring of wastewater. Listed below are the specific references in the Work Plan:

- **Section 3.2.5 Surface Decontamination:** Wastewater collection and management strategies.
- **Section 3.3.3 Management of Secondary Waste:** The overall strategy for managing wastewater, as one of the primary aspects of secondary waste, through the site wastewater treatment system.
- **Section 3.5.2 Management of Contaminated Water:** References site procedure to be used for the evaluation and management of contaminated wastewater.
- **Sampling and Analysis Plan (SAP)/Section 2 General Sampling and Data Collection Approach:** Focuses on wastewater sampling, among other aspects of sampling.
- **SAP/Section 3 Specific Sampling Programs:** Sampling for disposition of wastes, including wastewater. Determination of hazardous, radiological, and other waste characteristics.

The WWTS manager has been provided with a spreadsheet containing OU3 R/FS analytical data from intrusive sampling of the Plant 6/EW Complex components to determine whether potential elevated levels of contaminants of concern may be present. Based on an estimated 75,000 gallons of potential washwater, it is anticipated that up to twenty-eight samples will be taken to determine isotopic radiological and heavy metals concentrations prior to discharge into the Advanced Wastewater Treatment Facility. Of those twenty-eight samples, one will be a duplicate for quality assurance/quality control purposes. The purpose of the sampling is to ensure the adequacy of treatment capacity so that National Pollutant Discharge Elimination System (NPDES) permit requirements are met.

Project-specific reporting for wastewater (i.e., equipment decontamination washwater) collection and treatment will be provided in the project completion report, which will include a summary of the results generated during the project. For site-wide air monitoring, the report will identify site air monitoring stations but refer to reporting under the Integrated Environmental Monitoring Plan (IEMP) (DOE 1997b).

Radiological Air Monitoring

Occupational monitoring will be performed using personal and workplace air samplers in the work areas to ensure worker protection and will also serve as an indication of the effectiveness of engineering controls. Since Plant 6 will be enclosed (sealed) during D&D, any potential emissions that could affect the outside environment would be detected first by occupational monitoring. Section 8.1 of the OU3 RD/RA Health and Safety Plan (Appendix E of the OU3 Integrated RD/RA Work Plan) describes the occupational air monitoring program.

Environmental radiological air monitoring during the D&D of the Plant 6/EW Complex project will consist of the Fernald Site Environmental Monitoring Program described in the site-wide IEMP, and discussed in Sections 3.5.1 and 3.6.2.1 of the OU3 Integrated RD/RA Work Plan. FEMP boundary monitors are shown in Figure 2-1.

The need for a supplemental environmental radiological air monitoring program for this D&D project was evaluated by modeling the potential release of radiological (uranium) contaminants from the components during D&D. The result of that modeling effort reveals that uranium emissions would be negligible and therefore, supplemental radiological monitoring is not warranted.

Radiological survey data summarized in Table 2-1 were used for the air emissions modeling input. Computer modeling of potential uranium emissions from the Plant 6/EW Complex was performed using the CAP88PC method to measure potential dose impacts from the project. CAP88PC is the personal computer version of the U.S. EPA model CAP88 that is the approved method for predicting dose impacts to off-site personnel from emissions of radionuclides under the National Emissions Standards for Hazardous Air Pollutants (NESHAPs) regulations. It is

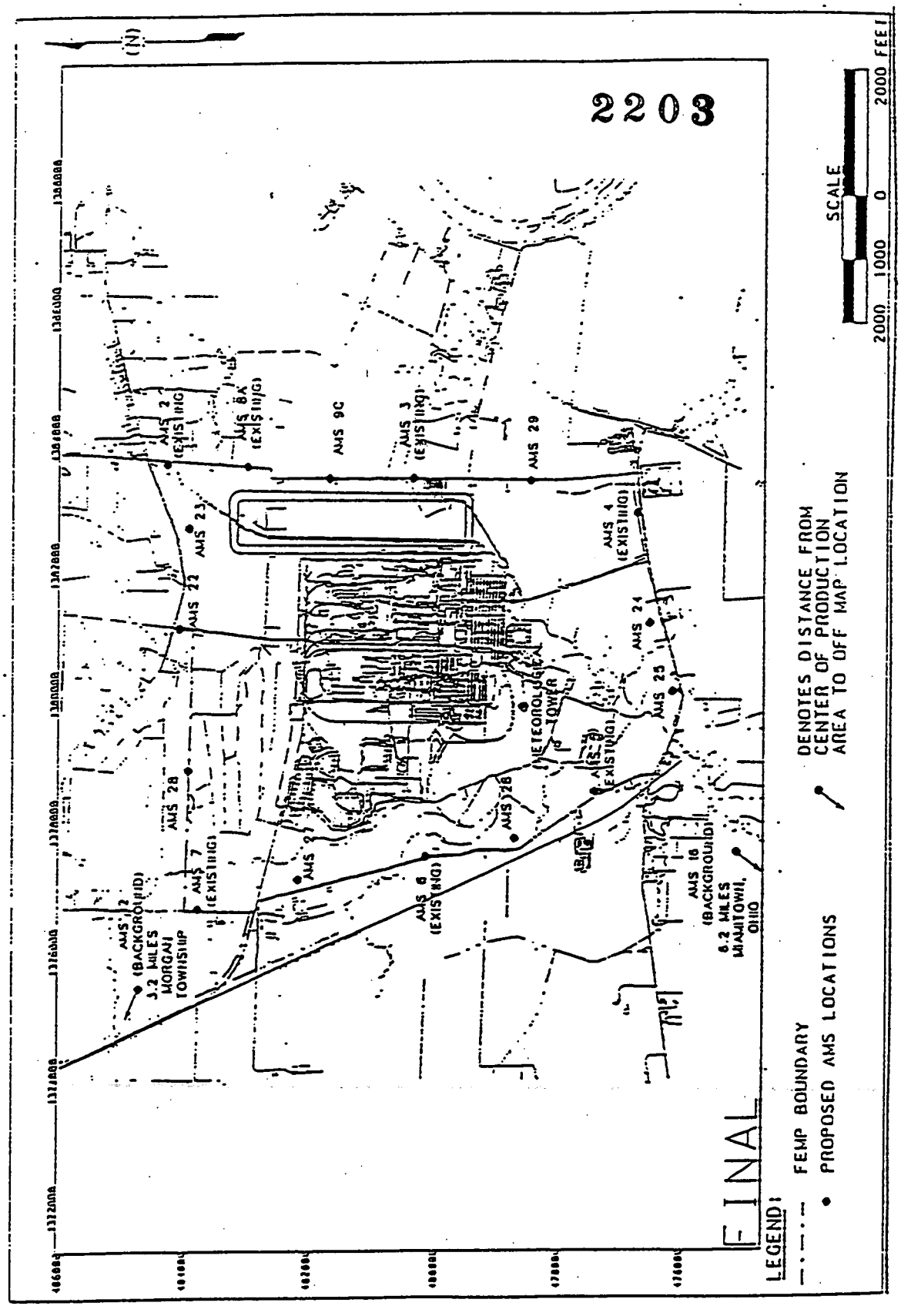

FIGURE 2-1 FEMP Site Air Monitoring Locations

28

emphasized that the CAP88PC model is being used as a tool to assess potential dose to off-site personnel from radionuclide emissions from a project in order to identify potential mitigative controls and supplemental monitoring measures; it is not being used as a means to demonstrate compliance with NESHAPs Subpart H. The method to be used for demonstrating NESHAPs Subpart H compliance is presented in the IEMP as a collective sitewide strategy.

The CAP88PC modeling methodology is prescribed by the U.S. EPA reference manual: U.S. EPA User's Guide for CAP88, Version 1.0, 402-B-92-001. Computer modeling of potential radiological emissions from the Plant 6/EW Complex used radiological smear data to provide a more realistic measure of removable alpha, beta, and gamma contamination rather than fixed contamination (identified through intrusive sampling results from the OU3 RI/FS database and direct surface contamination surveys) for estimating contaminant release. The removable contamination data obtained through smear sampling represents a model input that depicts worst case emissions since it represents removable contamination present prior to the decontamination activities.

The modeling methodology assumed no controls on emissions release, such as HEPA filters on containment ventilation systems and a percentage (of removable contamination) that would become airborne during D&D activities. Potential emissions sources were treated as being in readily dispersible forms. The results of the computer modeling indicated that the maximally exposed individual would theoretically be located approximately 904 meters east-southeast of the project area and would potentially receive a maximum Effective Dose Equivalent of 4.3 x 10^{-4} mrem/year from the D&D activities. Based on a review of the results of the computer modeling, no supplemental environmental air monitoring will be required for the Plant 6/EW Complex D&D activities.

Further justification for not providing project specific air monitors comes from analysis of data from the Plant 7 Dismantling - Removal Action No. 19 Final Report (DOE 1995), the Project Completion Report for Building 4A (DOE 1997c), and the Plant 1 Complex - Phase I Project Completion Report (DOE 1997d), which have shown that dismantlement activities resulted in negligible airborne radiological contaminant emissions. Results for airborne uranium contamination during those projects have been approximately 5 percent of the DOE maximum off-site guidelines of 0.1 pCi/m^3. The relationship between pCi/m^3 and mrem/year may be understood by the conversion factor used to equate the two terms at the FEMP: if inhaled

continuously (24 hours/day, 365 days/year), 0.1 pCi/m^3 of uranium in air will result in a dose of 100 mrem/year. It should be noted that various assumptions have been incorporated into this conversion factor. Mitigative measures that might be employed in the event of exceedence of the set criterion would include an increase in engineering and administrative controls during a particular task that has been identified as the cause or possible cause of the elevated radiological levels. Such controls could include negative pressure within an enclosed work area using additional HEPA filtration units or additional surface cleaning (wash) steps before removing material from the containment area.

2.5 Remediation Activities

A general approach to the above-grade decontamination and dismantlement of the Plant 6/EW Complex is described in the following subsections. Section 3 elaborates on this discussion by identifying component-specific interests concerning the remedial tasks listed below, as applicable. The remedial tasks that apply to the Plant 6/EW Complex include the following:

- Preparatory Action: Inventory Removal;
- Preparatory Action: Facility/Safe Shutdown;
- Hazardous Waste Management Unit Decontamination;
- Asbestos Removal;
- Surface Decontamination; and
- Above-Grade Dismantlement.

Although the six remedial tasks are generally described in the order in which they have been (in the case of Preparatory Actions) or will be performed, the actual order for performing these activities may differ from the sequence presented in this plan as a result of evaluation and selection of alternate methods by the Contractor as approved by the FEMP Project Manager.

As required by Specification 01515 (Mobilization), the Contractor will mobilize in preparation for the D&D activities by establishing the construction zone boundary and material handling and containerization area(s), providing portable support facilities as needed, extending water and electrical utilities from designated tie-ins, and establishing stormwater controls. The proposed construction zone boundary is delineated in Drawing No. 06X-5500-X-08262 (Appendix D). Equipment that is potentially contaminated due to a history of use at another

radiological facility will be inspected by OU3 Project Management and surveyed by radiological control technicians to ensure that no contamination or items prohibited by the FEMP are brought on-site. A sign-in station will be established at the entrance to the job site for posting of permits and health and safety plans. Additional radiological control boundaries will be established in various areas as necessary prior to starting remediation activities in those areas. These boundaries will be established prior to starting in order to locate contaminated material staging areas as well as access and egress points to and from contaminated areas.

As required in the performance specifications, the Contractor will develop and submit for FEMP Project Management approval safe work plans detailing work activities. Examples of such plans include details relative to where the Contractor will erect barriers and fences for radiological control (Specification Section 01515), controlling fugitive emissions (Specification Section 15067), stormwater run-off protection (Specification 01515), and controlling erosion (Specification Section 01515). Throughout the remediation activities, the Contractor will be responsible for notifying FEMP Project Management of conditions in the field (e.g., chemical spills, leaking containers) that require environmental response. All conditions that necessitate a response will be dealt with immediately.

2.5.1 Preparatory Action: Inventory Removal

Existing waste/product inventories will be removed from the Plant 6/EW Complex components and transported to interim storage facilities or off-site disposal facilities under the decisions and procedures adopted from Removal Action No. 9, Removal of Waste Inventories. Currently, Buildings 77 (Finished Products Warehouse), 79 (Plant 6 Warehouse), and 63 (KC-2 Warehouse) are being used for Waste Management Activities and will undergo inventory removal prior to OU3 remediation.

2.5.2 Preparatory Action: Facility/Safe Shutdown

Facility/Safe Shutdown activities were performed by FEMP personnel under Removal Action No. 12 procedures to further prepare the facilities for remediation. The Plant 6 Facility/Safe Shutdown activities were completed March 11, 1999 and consisted of the following:

- removal of all salvageable equipment;

- removal of loose, gross contamination;
- removal of hold-up material;
- general clean-up; and
- disconnection of all utilities.

2203

All steam, potable water, electrical power, fire protection alarms and systems, compressed air, and communication systems were disconnected at the equipment or at the building exterior to establish the known condition of each energy source within the remediation area. Section 3.2.2 of the OU3 Integrated RD/RA Work Plan further discusses the scope of this preparatory action.

Facility Shutdown (utility isolation) of the East Warehouse Structures will be completed prior to D&D of these components.

2.5.3 Hazardous Waste Management Unit Decontamination

The remedial design for the Plant 6/EW Complex included the assessment of potential contaminants in HWMU No. 34 (Building 63 KC-2 Warehouse) and HWMU No.37 (Bldg. 79 Plant 6 Warehouse). These HWMUs will be remediated under the RCRA/CERCLA integrated process which was described in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan. Remediation requirements for HWMU 34 and 37 are specified in Section 3.8 and 3.10 respectively of this implementation plan as component-specific remediation tasks for Buildings 63 and 79.

2.5.4 Asbestos Removal

The removal of ACM from components will be conducted by a Contractor qualified to conduct asbestos abatement operations. This activity will involve removing all friable types of asbestos, typically consisting of thermal system insulation (TSI) on pipes and equipment. Table 2-2 of this Implementation Plan provides a summary of the areas in the Plant 6/EW Complex known to contain ACM. ACM removal strategies to be applied to this project were discussed in depth in Section 3.2.4 of the OU3 Integrated RD/RA Work Plan. The project specific requirements for ACM removal are specified in Specification Section 01516.

2.5.5 Surface Decontamination

Surface decontamination refers to the cleaning of surface contamination and/or encapsulation of contaminants in order to minimize the potential for release of contaminants during demolition activities. Specification Section 01517 addresses the removal and/or fixing of radiological contamination and generally covers the following activities:

- cleaning low-level uranium contaminated materials and/or building surfaces by contaminant removal or encapsulation to meet debris and/or structure release criteria;
- cleaning process equipment and materials to remove visible process residues, if practicable; and
- controlling and moving effluent produced during the removal and/or fixing of contamination.

To identify materials/surfaces that may require surface cleaning, existing radiological surveys were reviewed. These surveys provide Radiological Engineers with an indication of the extent of alpha removable, and beta-gamma removable, and total beta-gamma radiological contamination.

Prior to removing debris from a building enclosure or local containment, all external surfaces will be cleaned per Specification Sections 01517 and 01120. Specification Section 01517 identifies the requirements for removing/fixing of contamination, including DOE-approved methods, while Specification Section 01120 identifies the level of decontamination needed to meet material handling criteria. Among other requirements, these specifications require removal of visible surface contamination and sealing of all openings of equipment and debris that are potentially contaminated. For large items such as ductwork, the Contractor may encapsulate all internal surfaces in lieu of sealing. Acceptable methods for cleaning surface contamination include, but are not limited to: low volume hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, etc. FEMP Project Management will be notified prior to encapsulation of debris to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2 of Specification Section 01517, and reinforced polyethylene sheeting which is sealed prior to movement to prevent migration of potential contaminants.

Prior to opening the structures to the environment by removing the exterior siding or through structural dismantlement, the Contractor is required to remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below the criteria as defined in Part 8 of the IFB/RFP ("Facility Release Criteria"). FDF will perform a radiological release survey to ensure the radioactivity criteria are met.

2.5.6 Above-Grade Dismantlement

All above-grade dismantlement activities to be performed during the Plant 6/EW Complex project are described in Section 3.2.6 of the OU3 Integrated RD/RA Work Plan. The specification sections listed below describe various project applications of structural building/component dismantlement:

1) Bulk Removal - includes removal of electrical components, piping, construction debris, and heating, ventilation and air conditioning (HVAC) systems: (Specification 15065);
2) Equipment/System Dismantlement: Specification 15065;
3) Transite Removal: Specification 07415;
4) Structural Steel Dismantlement: Specification 05126; and
5) Concrete/Masonry Removal: Specification 03315.

The Contractor is required by each of the above-referenced specifications to submit a Safe Work Plan for approval by FEMP Project Management. Content, such as methods, and submittal requirements for Safe Work Plans are described in each of the performance specification sections. Based on these and other supporting specifications, a general description of above-grade dismantlement tasks is described below, while building-specific above-grade dismantlement tasks are discussed in Section 3.

Bulk Removal

Prior to breaching any system, the Contractor and FEMP Project Management will verify that all the systems are de-energized.

All piping, valves, electrical components, conduit, wire, cable trays, construction debris, and HVAC systems will be removed and reduced in size. During removal of HVAC ductwork, internal surfaces will be visually inspected to ensure the absence of free liquids or solid

materials. If free liquids or solid materials are found, an evaluation will be initiated by the FEMP Project Manager to determine the requirements for material handling and removal. The evaluation will identify the contents and requirements for containerization, storage, and disposal. If the item fails visual inspection, it shall be considered to be "process debris" and disposed appropriately; as described in Specification Section 01120 and the Waste Management Plan.

Methods such as reciprocating saws, portable band saws, and shears are the preferred methods for bulk removal. Surface wiping or HEPA filtered vacuuming may be required for contaminated surfaces where cuts are planned in order to minimize transferrable contamination. Methods that minimize volatilization and release of paint constituents and other contamination are preferred; however, alternative methods may be proposed provided that HEPA-filtered local ventilation and adequate respiratory protection are used. Continuous workplace air monitoring for radioactivity will be performed to ensure that engineering controls employed by the Contractor are adequate.

Equipment/System Dismantlement

As equipment/systems are removed, the previously inaccessible surfaces will be visually inspected to ensure the absence of free liquids or debris. If these materials are found, an evaluation will be initiated by FEMP Project Management to determine the appropriate removal and handling requirements for the material (Specification Section 15065).

Details included in the Safe Work Plan for equipment removal will include the sequence, methods of removal and dismantlement, equipment required, catalog cut sheets, drawings and methods and materials to control generation of airborne contaminants from cutting operations, etc. Staging of removed equipment and size reduction will be proposed by the Contractor and approved by FEMP Project Management.

Transite Removal

Specification Section 07415 addresses the requirements for removal of interior and exterior transite panels. Prior to removing any transite panels, a coating of amended water or encapsulant will be applied to lock down any loose fibers. A screw gun or bolt cutter is the preferred method for removing the panel fasteners. If the fasteners are not removed with a screw gun, then the area around the fastener will be sprayed with a fixative allowing the fastener to be pried out. Prior to locking down contamination, Specification Section 07415

requires the Contractor to demonstrate the proposed method to be utilized. After the screw is pried out, the fixative will be reapplied. If a broken panel is encountered, then the area around the break will be sprayed with amended water or encapsulated with the fixative. HEPA vacuums will be available to collect any loose material.

The mineral wool batt insulation will be removed and containerized during interior transite removal. As the insulation is removed, a visual inspection and a radiological survey will be performed on the newly exposed surfaces. Indications of friable asbestos will require gathering the loose material and locking the remaining fibers in place. If radiological survey results indicate the need to perform decontamination or lock down of the areas to levels consistent with surrounding building surfaces, then these activities will be performed. Fasteners and molding that hold the panels and insulation in place will also be removed as part of this operation. In some instances, the interior transite roof panels may be removed after the exterior transite panels have been removed.

Prior to exterior transite panel removal, Specification Section 07415 specifies that the Contractor shall remove and or fix radiological contamination on all structural surfaces within the facility until the detected radioactivity levels are below the criteria defined in Part 8 of the IFB/RFP.

Structural Steel Dismantlement

Specification Section 05126 addresses structural steel dismantlement requirements. Exterior metal panels will be left in place on the structural steel members. All remaining items, such as non-load bearing steel members, windows and frames, doors, gutters and down spouts, will be removed using mechanical means. As these items are removed, the exposed component surfaces have the potential of holding debris and contamination. These areas will be visually inspected to determine if these surfaces meet the decontamination requirements of Specification Section 01517.

For all of the components in the Plant 6/EW Complex, hydraulic shears or oxy-acetylene torches are expected to be used to dismantle and size reduce the structural steel frame. Prior to and during dismantlement, the area surrounding the structure will be sprayed with water as necessary to reduce fugitive dust emissions.

The Contractor will be required, pursuant to Specification Section 05126, to address the following for structural steel removal in their Safe Work Plan:

- Detailed sequence of dismantlement and method of cutting, including equipment to be used;
- Methods for contaminant control, including fugitive emissions during cutting;
- Detailed plan for protecting lay down and cutting areas from contamination by lead paint chips and for controlling airborne radiological emissions;
- Methods and materials used for cutting lead-painted steel;
- If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Registered Professional Engineer; and
- Plans for personnel tie offs, use of pick boards and walking on or near roof purlins/girders.

Furthermore, Specification Section 05126 requires that the Contractor apply mechanical means of cutting to remove the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

Concrete Masonry Unit (CMU) Removal

Specification Section 03315 requires the Contractor to develop a Safe Work Plan for concrete/masonry removal that contains the following information:

- Detailed method and sequence of dismantlement, including equipment to be used;
- Methods for control of contaminants, including control of fugitive emissions;
- Materials, such as non-woven geotextile fabrics and surfactants, to be used;
- Methods of cutting, including equipment to be used;
- Calculations to verify structural adequacy of partially dismantled structure, as applicable; and

The CMU walls will be radiologically surveyed prior to removal to determine the need for engineering controls, such as an enclosure with ventilation or water sprays to minimize fugitive dust, during removal operations. When controls are necessary, best available control technologies will be applied to CMU removal operations.

Specification Section 01515 addresses requirements relative to the preparation of the base slab during demobilization. Specifically, openings in the slab will be filled with granular material or soils and grout to provide a flat uniform surface to minimize the chance for water accumulation and migration, and to mitigate potential safety hazards. Wire and cable will be cut away to grade from the conduit embedded in the concrete. Conduit and other slab obstructions will be cut away to grade, plugged, and covered with grout to grade level for positive drainage.

2.6 Use of New Technologies

The promotion and/or incorporation of new and innovative technologies is encouraged for the Plant 6/EW Complex D&D project to accomplish safer, quicker, or less expensive remediation. While the performance specifications provide an avenue for the Contractor to propose new and innovative technologies, FEMP Project Management can only encourage use of particular technologies by listing them as "approved" under the subheading of PRODUCTS or as a description of an acceptable method in the subheading APPLICATION in the specifications. FEMP Project Management will review and approve products and methods that have the most benefit to the project and overall success for the OU3 remedial action.

3.0 COMPONENT-SPECIFIC REMEDIATION

This section presents component-specific remediation tasks identified for the Plant 6/EW Complex D&D project. Background information provided in this section was obtained primarily from the OU3 RI/FS Work Plan Addendum (DOE 1993) and remediation contract Statement of Work (SOW). Structural (plan and section view) drawings have been compiled for each of the Plant 6/EW Complex components and are shown in Appendix D (see Appendix D list of drawings for component identification). Photographs illustrating various features throughout the Complex are provided in Appendix E (see listing of photograph numbers and accompanying drawing in Appendix E for photograph identification). Information regarding the remediation approach was obtained from the remediation contract SOW, performance specifications, and the OU3 Integrated RD/RA Work Plan.

3.1 Building 6A — Metals Fabrication Plant

Background

Building 6A (Metals Fabrication Plant) is a single-level, irregularly shaped building measuring approximately 350 ft. × 620 ft. and 50 ft. high with a partial basement 20 ft. below-grade. Building 6A consists of a structural steel frame on a reinforced poured concrete base and floor with transite siding and roofing. For shielding purposes, several concrete walls separate some of the process areas. The floors are poured concrete, except for three process areas that have acid-brick-lined diked areas (Scrap Pickling, Old Water Treatment, and Chip Briquetting). The acid brick in these three process areas have been identified in the OU3 RI/FS Report as potential mixed wastes and must be treated and disposed of at a Permitted Commercial Disposal Facility (PCDF).

Process Area Description — Building 6A was designed to perform major uranium metal fabrication processes, including rolling, machining, heat treating, pickling, scrap metal briquetting, and inspection/packaging of products. All processes were discontinued in 1989; however, most of the process equipment has not been dismantled or removed from the building. Some machining equipment was removed to clear Building 6A for waste inventory storage that occurred through 1998.

The major processes performed in Building 6A, including many of the sub-processes that were involved, are described below.

2203

Rolling Mill Process Area. The Rolling Mill was constructed in 1952 to roll uranium ingots (received from Plant 5) into rods, flats, or ovals as required. The Rolling Mill was constructed in, and currently occupies, the majority of the western half of Building 6A (known as the Mill Room). The equipment has been abandoned in place and is largely inaccessible because of uranium dust contamination. Sub-grade access to the mill exists throughout most of the Rolling Mill bay.

Production from the Rolling Mill was permanently shut down in the 1970s. Additionally, the NuSal Furnace (originally part of the Rolling Mill process area) was used during the 1980s for beta heat treating ingots before shipment for extrusion. The Rolling Mill process area included the sub-processes detailed below.

New Ingot Furnace. Uranium metal (in the form of ingots) was received by the ingot storage area to be scheduled for rolling. The ingots were stored until they were charged to the ingot furnace. The New (automatic) Ingot Furnace was an electrically heated, continuous liquid bath furnace that heated the ingots sufficiently to allow rolling. A salt bath of lithium carbonate (Li_2CO_3) and potassium carbonate (K_2CO_3) was used as the heating medium. The New Ingot Furnace delivered the heated ingot to the Blooming Mill approach table.

Blooming Mill. The function of the reversing Blooming (billet) Mill was to reduce the cross-sectional area of a heated ingot (as received from the New Ingot Furnace) to a point where the size and shape of the pieces were suitable for further cross-sectional reduction in the Continuous Bar Mill. The ingots were discharged from the Blooming Mill onto the runout table.

Cropping. The cropping step followed rough rolling in the Blooming Mill and removed the end portion of the billet that had been distorted or "fish-tailed" during the blooming process. Cropping was accomplished with 60-ton up and down cut shears. The subsequent cropped material was sent for further processing in the Metals Fabrication Plant. The crop ends were cooled in a water-filled tank and sent to the Metals Production Plant (Component 5A) casting area for recycling.

Equalizing Furnace. The function of the Equalizing Furnace was to receive the oval billets (after they had been rolled, cropped, and cut into lengths) and increase their temperature. The furnace was also used on occasion to reheat round bars, which had already been run through the Continuous Bar Mill but required a further reduction in cross section. Like the New Ingot Furnace, the Equalizing Furnace was electrically heated and used a salt bath of Li_2CO_3 and K_2CO_3 for a heating medium.

Continuous Bar Mill. The function of the continuous Bar Mill was to convert oval billets (as received from the Blooming Mill) to round bars so that they could be fed to the Core Machining process to produce slugs. The Continuous Bar Mill consisted of alternate vertical and horizontal roll stands set in a straight line. Oval passes were cut in the vertical rolls at stands 1, 3, and 5, while round passes were cut in the horizontal rolls at stands 2, 4, and 6. This mill was designated "continuous" because the billet passed from stand to stand and was not reversed for multiple passes through a single stand.

Electrical Bay and Basement. The extreme western north-south bays of Building 6A contain the electrical switching, transformer, and disconnect apparatus for support of the Rolling Mill operation. In addition, a basement area exists under a portion of the electrical bay.

Machining Area. The machining process area makes up much of the area in the eastern portion of Building 6A and includes the following sub-processes.

Core Machining. The primary function of the machines in the Core Machining area was to fabricate uranium rods into finished slugs. The routing of a slug through the machining area was dependent on the specifications to be met.

The Core Machining area currently contains two cutoff lathes separated by three earlier cutoff lathes, a drill press, a lathe, a chip conveyor, two vacuum cleaner units, and a condensate tank. This equipment has been generally cleaned of metal waste, and coolant oil has been drained.

Inspection Area. The Inspection Area covers a large portion of the northeastern quadrant of Building 6A. The primary operations of the area were to inspect finished slugs and to ensure that the slugs met all specifications. Although the specific layout of inspection equipment and

2203

stored product areas changed over the years, this area of the plant was always used primarily for inspection operations. As recently as 1989, equipment in the Inspection Area consisted of a roller conveyor with gravity and powered sections, a gauging jig, ultrasonic testing machines, scales, and wheeled carts for transporting shipping boxes.

Miscellaneous Machining. Flat cropping and sampling operations were performed on horizontal milling machines located in the southeastern areas of Building 6A. Cropping entailed cutting the rough or top end of a flat billet resulting from the casting process in Plant 5 (Building 5A). Sampling was accomplished by drilling and cutting a small piece from the flat billet, for laboratory testing. Milling machines in the 4A Program (tank shielding) machined uranium flats for the U.S. Army in the 1980s.

Maintenance Shop and Tool Machining. A local maintenance area is located northeast of the main portion of the core machining area. This shop provided specialized maintenance for Building 6A machines and processes. A large machining area was also associated with the maintenance shop to provide the cutting tools and jigs necessary for machining of uranium metal in the main machining operations.

Chip Briquetting. Uranium turnings, machining chips, and uranium sawdust from the operations of Buildings 5A, 6A, and 9A were collected, washed, pickled (in nitric acid), and crushed to form dense metal briquettes for remelt casting feed. This process was performed in the southeastern corner of Building 6A.

Heat Treating Area. The Heat Treating process area included two sub-processes performed in the south of Building 6A.

Salt Water (NuSal) Heat Treating. The purpose of Beta Heat Treating was to transform the grain structure and relieve stresses of uranium rod stock by heat treating the rods in a salt bath furnace. Beta Heat Treating facilities were not included in the original (1952) plant layout; however, the facilities were in place by 1958. During the years of Rolling Mill operations, the Beta Heat Treating facilities were used to process rods as they left the flying shear. The Beta or Salt-Water (NuSal) Heat Treating System consisted primarily of a furnace and a water quench tank. The furnace used a 50/50 blend of sodium chloride (NaCl) and potassium chloride (KCl) as a heating medium.

Amsler-Morton Furnace. The Amsler-Morton Furnace is adjacent to the Enriched Uranium Restricted Area in the southeastern corner of Building 6A. The area is inaccessible because of high radiation exposure rates; consequently, information in this report has not been field verified. The furnace was used to heat-treat cores until its shutdown in 1970. Like the NuSal Heat Treating Furnace, the Amsler-Morton Furnace used a 50/50 blend of NaCl and KCl. The area also houses a water quench tank.

Vacuum Outgas Furnace. The Vacuum Outgas Furnace has a refractory-lined heating zone and a water-cooled cooling zone. The furnace and associated instrumentation are currently located at the extreme southern end of Building 6A. The furnace was used for out-gassing and baking mold coatings of graphite molds that were used in Buildings 5A and 9A. The Vacuum Out-gas Furnace is currently empty.

Old Water Treatment. The Old Water Treatment Plant, also known as the Plant 6 Sump, is located in a separate room in the northwestern corner of Building 6A. The Old Water Treatment facility started up when the plant opened in 1952. Some components of the facility currently remain in use.

During the production era, typical wastes sent to the water treatment process included acidified wastewater from the briquetting carousel sumps, slug washer tank fluids, and scrap pickling tank fluids. The aforementioned liquids were pumped to the 6,000-gal acid-hold tank or to the Scrap Pickling outside spent acid tank. Other treated liquids included non-acid and/or oily wastewater from floor sumps, nearby buildings, pads (storm runoff and fire deluge), oil clarifiers, and the Rolling Mill. These liquids were pumped to the 10,000-gallon inside settling tank or temporarily to the outside tank.

Pickling Area. The Pickling process area includes two pickling processes, an acid gas handling process, and the machining processes coolant clarifier process.

Scrap Pickling. The Scrap Pickling equipment consists of a three-compartment stainless steel rectangular tank that rests on the floor such that the uncovered top is approximately waist-high. Uranium scraps, ingots, and debris were routinely cleaned of surface oxidation in the Scrap Pickling area. The pieces were processed in mesh baskets or trays and then submerged in and moved between the tanks by an overhead track/hoist system. The entire Scrap Pickling

system was drained at plant shutdown in 1989. The tanks are free of visible residue. The trench behind the unit is visibly empty; however, the sump pump area currently contains liquids.

2203

Slug Pickling. Various types of uranium cores (collectively known as "slugs") were cleaned in this assembly line process. The slug washer used a concentrated caustic spray solution as the first step for removal of residual oil, dirt, and salt from the slugs. Following a water spray rinse, some products were moved off-line if pickling was not required, but most passed through a concentrated nitric acid dip, followed by a water rinse. The process continued with a neutralization rinse, followed by a hot water spray-and-dip rinse, and ended with hot air drying. The fluids in all of the Slug Pickling tanks, and the fan-forced air in the dryer, were heated by steam and/or hot-water internal heat exchangers.

Coolant Clarifiers. Three coolant clarifiers with rakes and pumps are located near the east side of Building 6A. The coolant oil from the Acme-Gridley machines, Turret Lathes, Heald Borematic machines, Centerless Grinders, and Cross Transfermatic machine went through clarifiers, where the insoluble oil layer was skimmed with rakes. The Coolant Clarifier units consisted of three primary components: a tank, flotation cell, and sludge scraper mechanism. The tank was constructed with two compartments, for dirty and clean coolant. The flotation cell included a motor drive rotor-stator assembly that provided a froth to entrain the insolubles and two skimmers driven by a separate motor. The sludge scraper mechanism contained a series of scrapers mounted on a drag chain conveyor that was driven at slow speed by a separate motor.

NO_x Destructor. The NO_x Destructor equipment was installed to serve various acid-related pickling processes in Building 6A: the Scrap Pickling operation, part of the Briquetting Carousel, and part of the Slug Washer line. Fumes from collection hoods over those processes were ducted directly to the bottom of the NO_x Destructor's first scrubbing tower. Flow through the system was provided by a blower in the roof-mounted exhaust stack. The fumes traveled up the first scrubber, exited at the top, entered the bottom of the second scrubber, and finally exited. Sodium sulfide (Na_2S) solution provided the NO_x destruction capability.

Remedial Tasks

Initial design anticipates five remedial tasks for Building 6A; these are described below.

Inventory Removal

Plant 6 was used for storage of waste/product inventories until consolidation of waste management operations on the Plant 1 Storage Pad in late 1998. Listed below in Table 3-1 are the inventory material numbers for Plant 6.

TABLE 3-1 Building 6A Inventory Material Removed

Material	Container Type	Number of Containers	Net Weight (lbs.)
Uranium Metal	White Metal Box	13	65,062
Solid Uranium Metal	55-gallon drums	78	96,060
Co-Packaged Solid Uranium Metal	Sea/Land	44	N/A*

* Net Weights will be determined prior to shipment

Facility/Safe Shutdown

Except for external power being supplied to the perched water system, utility disconnects and removal of gross contamination and hold-up material were performed on this facility during the facility/safe shutdown preparatory action. Facility/Safe Shutdown activities were completed March 11, 1999. In the event that additional hold-up materials are discovered in inaccessible equipment or systems, the FEMP Facility/Safe Shutdown workforce will be mobilized to remove that material once it becomes accessible.

TABLE 3-2 Plant 6 Hold-up Material Quantities

Material Type	Material Code	Quantity (lbs.)
Process Residues	001	12,513
Contaminated Coolant Oil	009	5589
Contaminated Oil	015	16,290
Contaminated Metallic Filter Elements	025	80
Dust Collector Bags	029	400
Oily Sludge, High Free Metal	041	475
Furnace Salt	060	29,500
Dust Collector Residues	132	1,620

2203

Asbestos Removal

Table 2-2 identified the areas in Building 6A that contain friable asbestos. Other areas of special note are listed below:

- The built- up roofs at the southeast corner of Plant 6 (column lines 22 through 30) and along the east side of Plant 6 (column lines 11 through 18) contain asbestos. The other built up roofs in the complex do not contain detectable levels of asbestos fibers.

- Exterior gutters and roof valleys contain debris which contains detectable amounts (>1%) of friable asbestos fibers. This gutter debris should be considered friable ACM.

- The refractory fire brick and mortar in several furnaces in Plant 6 have been sampled and found they do not contain asbestos. The furnaces which have been sampled are: salt oil treatment furnace, tocco heat treatment furnace, nusal furnace, enclosed furnace, equalizing furnace, salt bath furnace, and the old ingot furnace stack. The built- up roofs at the southeast corner of Plant 6 (column lines 22 through 30) and along the east side of Plant 6 (column lines 11 through 18) contain asbestos. The other built up roofs in the complex do not contain detectable levels of asbestos fibers.

Surface Decontamination

Building enclosures and personal and material access vestibules will be required for Building 6A depending on the facility turnover radiological survey results to be obtained following safe shutdown. The building will have to meet facility release criteria in Part 8C of the RFP prior to opening up the facility to the environment.

The preferred method for decontamination of equipment and system components is hydroblasting as allowed by Specification 01517. FEMP Project Management inspection of decontamination surfaces will follow to ensure that applicable criteria for decontamination are met.

Above-Grade Dismantlement

Per Specification 01515 Section 3.2 C.1 the active Plant 6 perched water system shall remain intact/uninterrupted during the course of D&D.

It is anticipated that dismantlement work in Building 6A will be performed in a contamination or high contamination area, and an airborne radioactivity area as defined in 10CFR 835. Following equipment/system dismantlement, the interior of the structure will be surveyed to ensure that facility release criteria have been met. Transite roofing and siding panels will be removed prior to structural dismantlement. The method of structural dismantlement will be proposed by the Contractor.

3.2 Building 6B — Plant 6 Covered Storage Area

Background

Building 6B (Plant 6 Covered Storage Area) is a single-story building located east of Plant 6. It is rectangular, measuring approximately 42 ft. × 60 ft. and 12 ft. high. Building 6B covers a storage pad east of the Metals Fabrication Plant (Building 6A) and consists of a structural steel frame with no sides and a metal roof on a reinforced concrete base.

Process Area Description — Building 6B is considered one process area and was used to store drummed uranium chips, turnings, briquettes, and residues for processing in the Metals Fabrication Plant or shipment to the Recovery Plant (Building 8A). Subsequently, maintenance/inventory wastes had been stored in Building 6B in metal shipping containers during Waste Management operations through 1998 but have since been removed.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 6B; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination material were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

Building enclosures and personal and material access vestibules may be required for Building 6B depending on the facility turnover radiological survey results to be obtained following safe shutdown. The building will have to meet facility release criteria in Part 8C of the RFP prior to opening the facility up to the environment.

Above-Grade Dismantlement

Based on the 12 foot height and construction of Building 6B, it appears that structural dismantlement may be accomplished by use of a trackhoe-mounted shear. The method of structural dismantlement will be proposed by the Contractor.

3.3 Building 6C — Plant 6 Electrostatic Precipitator South

Background

Building 6C (Plant 6 Electrostatic Precipitator South) is a single-level building measuring approximately 16 ft x 30 ft and 14 ft high. Building 6C is adjacent to the east side of the Metals Fabrication Plant (Component 6A) and consists of a poured concrete base and floor, a structural steel frame, and corrugated steel siding and roofing.

Process Area Description - Building 6C contains one process area, an electrostatic precipitator (Precipitron), which handled exhausts vented from the machining processes in the Metals Fabrication Plant. The electrostatic elements were typically not powered because exhausts contained moisture. Building 6C currently contains the Precipitron and air filters.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 6C; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

The building will have to meet facility release criteria in Part 8C of the RFP prior to opening the facility up to the environment.

Above-Grade Dismantlement

Equipment and interior bulk materials will be removed prior to structural dismantlement. Structural dismantlement may be accomplished by use of a trackhoe-mounted shear. The method of structural dismantlement will be proposed by the Contractor.

3.4 Building 6D — Plant 6 Electrostatic Precipitator Central

Background

Component 6D (Plant 6 Electrostatic Precipitator Central) comprises a steel precipitator housing, approximately 12 ft. × 20 ft and 15 ft high, and two cyclone separators in a concrete diked area. Building 6D is adjacent to the east side of the Metals Fabrication Plant (Component 6A).

Process Area Description - Component 6D contains one process area, an electrostatic precipitator (Precipitron) that handled exhausts vented from the machining processes in the Metals Fabrication Plant. The electrostatic elements were typically not powered because exhausts contained moisture. Building 6D currently contains the Precipitron, air filters, and two cyclones.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 6D; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

The building will have to meet facility release criteria in Part 8C of the RFP prior to opening the facility up to the environment.

Above-Grade Dismantlement

Equipment and interior bulk materials will be removed prior to structural dismantlement. Structural dismantlement may be accomplished by use of a trackhoe-mounted shear. The Contractor will propose the method of structural dismantlement.

3.5 Building 6E — Plant 6 Electrostatic Precipitator North

Background

Building 6E (Plant 6 Electrostatic Precipitator North) is a single-level building measuring

approximately 16 ft × 30 ft and 14 ft high. Building 6E is adjacent to the east side of the Metals Fabrication Plant (Component 6A) and consists of a poured concrete base and floor, a structural steel frame, and corrugated steel siding and roofing. L- 2203

Process Area Description - Building 6E contains one process area, an electrostatic precipitator (Precipitron), which handled exhausts vented from the machining processes in the Metals Fabrication Plant. The electrostatic elements were typically not powered because exhausts contained moisture. Building 6E currently contains the Precipitron and air filters.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 6E; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

The building will have to meet facility release criteria in Part 8C of the RFP prior to opening the facility up to the environment.

Above-Grade Dismantlement

Equipment and interior bulk materials will be removed prior to structural dismantlement. Structural dismantlement may be accomplished by use of a trackhoe-mounted shear. The Contractor will propose the method of structural dismantlement.

3.6 Building 6F — Salt-Oil Heat Treatment Building

Background

Building 6F (Salt-Oil Heat Treatment Building) is a single-level building that adjoins the south end of the Metals Fabrication Plant (Component 6A). The rectangular building measures approximately 25 ft × 45 ft and 20 ft high. The building consists of a structural steel frame on a concrete base with transite siding and roofing panels.

Process Area Description - Building 6F contains an immersion electrode salt furnace, a molten

salt tank, an oil quench tank, a hot water washer with attached sump tank, two heat exchangers, a trenched floor sump, and a chain conveyor. All of the equipment is included in the salt-oil heat treating process.

Mark 31 Target Element Cores were processed in the Building 6F salt-oil heat treating system located at the south end of the Metals Fabrication Plant. This was the only production molten salt-dip operation at the site that used oil rather than water for quenching. Heat treating and quenching operational times and temperatures were strictly controlled to achieve uniform core grain properties. The Mark 31 cores were loaded into steel baskets and heated in a 50/50 molten salt mixture of sodium chloride and potassium chloride. The furnace was electric, with three pairs of water-cooled electrodes.

Remedial Tasks

Initial design anticipates three remedial tasks apply to Building 6F; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

Building enclosures and personal and material access vestibules may be installed prior to commencing D&D activities with Building 6F. If utilized, the enclosure and vestibules will be maintained until the facility release criteria contained in Part 8C of the RFP are met.

Above-Grade Dismantlement

It is anticipated that dismantlement work in 6F will be performed in a contamination or high contamination area, and an airborne radioactivity area as defined in 10CFR 835. Following equipment/system dismantlement, the interior of the structure will be surveyed to ensure that facility release criteria have been met. Transite panels will be removed prior to structural dismantlement. The method of structural dismantlement will be proposed by the Contractor.

3.7 Building 6G — Plant 6 Sump Building

R- 2203

Background

Building 6G (Plant 6 Sump Building) is a newly built, unused, multi-story structure located on the northwest corner of the Metals Fabrication Plant (6A). The Plant 6 Sump Building is constructed of a steel frame with metal siding and roofing. The structure was built on a reinforced concrete pad. The approximate dimensions of Building 6G are 42 ft x 90 ft x 39 feet in height.

Process Area Description - The Plant 6 Sump Building was constructed for the purpose of replacing the existing water treatment system in the Metals Fabrication Plant. The new system was never utilized due to suspension in site production activities. Based on a visual inspection, at least ten floor sumps are located around the periphery of the building. Each sump is individually diked with concrete. Utility and process piping is present in the building including nitric acid lines and insulated steam lines. No visible signs of chemical contamination are present. As the facility is new and unused, there are no anticipated contaminants for Building 6G.

Remedial Tasks

Initial design anticipates three remedial tasks apply to Building 6G; these are described below.

Facility/Safe Shutdown

Utility disconnects and removal of gross contamination were performed on this facility during the facility/safe shutdown preparatory action.

Surface Decontamination

Since Building 6G was not used during FEMP production operations only gross surface cleaning is expected.

Above-Grade Dismantlement

It is anticipated that the majority of the work in 6G may be performed in a controlled area. Following release cleaning of the interior of the Building 6G, structural dismantlement will most likely be performed with a trackhoe-mounted shear.

3.8 Building 77 — Finished Products Warehouse (4A Warehouse)

Background

Building 77 (Finished Products Warehouse/4A Warehouse) is a single-story building. It is rectangular, measuring approximately 120 ft × 162 ft and 12 ft high. The building consists of a structural steel frame on a reinforced poured concrete base and floor with noninsulated, corrugated metal siding and roofing.

Process Area Description - Building 77 was constructed as a storage warehouse for flat uranium ingot products awaiting shipment and miscellaneous reject products, as well as the interim storage of uranium materials awaiting processing. Building 77, Finished Products Warehouse, is currently being used for the storage of containers of enriched restricted materials; however, these containers will be removed as an inventory removal preparatory action prior to facility turnover to D&D Project Management.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 77; these are described below.

Facility/Safe Shutdown

Facility shutdown will be performed by FEMP Waste Management prior to turnover to Plant 6/EW Complex D&D Project Management. Stored materials will be removed and surfaces of the building will undergo gross contaminant removal as needed. A radiological survey of the building will be provided as a condition of turnover.

Surface Decontamination

Based on process history and radiological survey data, typical decontamination measures are anticipated for Building 77; the design did not identify any conditions that would require particular decontamination methods not already addressed by the specifications.

Above-Grade Dismantlement

It is anticipated that the dismantlement of Building 77 will occur by shearing.

3.9 Building 79 — Plant 6 Warehouse

2203

Background

Building 79 (Plant 6 Warehouse) is a single-story building. The rectangular building measures approximately 100 ft × 170 ft and 15 ft high. It consists of a structural steel frame with noninsulated, corrugated metal siding and roofing on a reinforced poured concrete base and floor.

Process Area Description - Building 79 currently serves as a designated RCRA hazardous waste management unit (HWMU #37). It is also used for the storage of containers of polychlorinated biphenyl (PCB) wastes. The warehouse is located east of Plant 6. It measures approximately 100 ft. x 170 ft. and consists of a steel frame, with an 8 inch thick reinforced concrete slab. The warehouse is divided into three bays delineated by concrete curbing. The concrete curbs vary in height with a minimum curb height of six inches. Building 79 has operated as a hazardous waste management unit since 1989 and has been used for the storage of PCB wastes since 1988. The previously sealed floors and curbs were re-coated with a chemically resistant sealant in December 1992. The drum equivalent storage capacities for each bay are as follows:

Bay A - This bay is approximately 58 ft. x 78 ft. and has a maximum storage capacity of 1,492 55-gallon drum equivalents.

Bay B - This bay is approximately 54 ft. x 86 ft. and has a maximum storage capacity of 1,448 55-gallon drum equivalents.

Bay C - This bay is approximately 54 ft. x 82 ft. and has a maximum storage capacity of 1,256 55-gallon drum equivalents.

Remedial Tasks

Building 79 is currently being used for the storage of containers of hazardous wastes and PCBs; however, these containers will be removed as an inventory removal preparatory action prior to facility turnover to Plant 6/EW Complex D&D Project Management. Aside from utility disconnections and removal of salvageable equipment, no other preparatory actions will be necessary. There exists a possibility that HWMU #37 will be closed prior to the D&D of the Plant 6/EW Complex to allow for the building to be utilized as storage and or change/decon area facility.

HWMU Decontamination

Purpose: The decontamination requirements needed to accomplish the remediation goals for Plant 6 Warehouse (HWMU #37) consistent with the RCRA/CERCLA Integration strategy are discussed in Section 3.5.3.3 of the OU3 Integrated RD/RA Work Plan.

Scope: The Plant 6 Warehouse has been designated as an active HWMU because it has been used to store RCRA hazardous wastes (characteristic and listed) for greater than 90 days (OAC 3745-66-70 and 40 CFR 265.170). Prior to turning this building over to the Contractor, all containers of waste will be removed from the building.

Facility records document that 117 spills of hazardous waste have occurred in this HWMU. These records indicate that the spills occurred after the application of the sealant coatings to the floors of the bays; they were of very low volumes (the total quantity of waste released from these spills is approximately 33 gallons); and they were promptly cleaned up. The largest quantity of waste spilled is 19 gallons of sludge characterized as D005 (barium) and D008 (lead). This spill occurred in 1989. Two spills involving a total quantity of two ounces of PCB wastes have been documented for this unit. These spills were also promptly cleaned up.

Due to the number of hazardous waste spills recorded in this unit, a decontamination rinse will be conducted to verify that the unit is closed in accordance with Ohio EPA closure standards. The secondary containment structures will be vacuumed and/or hydrocleaned to remove surface residues. The surface of each bay will be rinsed with a solution of potable water. The rinseate will be sampled for the Toxic Characteristic Leaching Procedure (TCLP) constituents associated with wastes stored in this unit to verify decontamination in accordance with Ohio EPA Closure Guidance requirements. These constituents include arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, benzene, carbon tetrachloride, chlorobenzene, cresol, chlordane, 1,4-dichlorobenzene, pyridine, hexachlorobutadiene, hexachlorobenzene, 1,2-dichloroethane, 1,1-dichloroethylene, 2,4-dinitrotoluene, hexachoroethane, nitrobenzene, 2,4,6-trichlorophenol, tetrachloroethylene, trichloroethylene, vinyl chloride and methyl ethyl ketone. Since the rinseate may contain RCRA-listed and characteristic wastes, it will be evaluated and managed per procedure EP-0005, "Controlling Aqueous Wastewater Discharges into the Wastewater Treatment System."

2203

Above-Grade Dismantlement

It is anticipated that the dismantlement of Building 79 will occur by shearing.

3.10 Building 82A — Receiving/Incoming Materials Inspection

Background

The Receiving/Incoming Materials Inspection Building (82A) is located south of the Elevated Potable Storage Tank (20D). Building 82A consists of a structural steel frame, metal siding and roofing, and a reinforced concrete base. The dimensions of the building are approximately 100 ft x 100 ft x 17 ft high.

Process Area Description - The Receiving/Incoming Materials Inspection Building is used to accept and examine the nonradioactive materials and supplies which arrive routinely at the site. There are offices and receiving equipment in the building. The building is also used as a controlled area exit. During an inspection, no visual chemical contamination was noted. There are no anticipated contaminants for Building 82.

Remedial Tasks

Initial design anticipates three remedial tasks for Building 82A.

Facility/Safe Shutdown

Facility shutdown will be performed by FEMP Waste Management prior to turnover to Plant 6/EW Complex D&D Project Management. Surfaces of the building will undergo gross contaminant removal as needed. A radiological survey of the building will be provided as a condition of turnover.

Surface Decontamination

Based on process history and radiological survey data, typical decontamination measures are anticipated for Building 82A; the design did not identify any conditions that would require particular decontamination methods not already addressed by the specifications.

Above-Grade Dismantlement

It is anticipated that the dismantlement of Building 82A will occur by shearing.

3.11 Component 20D — Elevated Potable Storage Tank

Background

Component 20D (Elevated Potable Storage Tank) is located along 'E' Street, east of the Metals Fabrication Plant (6A) and south of Building 79 (the Plant 6 Warehouse). Component 20D is a steel structure 100 feet in height supporting a 30 ft x 40 ft water storage tank.

Process Area Description - Component 20D was utilized to store water for onsite fire protection and other potable uses. Component 20D has a maximum storage capacity of 210,00 gallons. The water was received from Well Houses 1, 2, and 3 (20E, 20F, and 20G, respectively). During an inspection, no visible chemical contamination was noted.

Remedial Tasks

Initial design anticipates three remedial tasks for 20D.

Facility/Safe Shutdown

Facility/safe shutdown activities will consist of de-energizing all electrical utility services.

Asbestos Removal

Asbestos removal will consist of removing insulation from the center standpipe. Asbestos work areas will be established around appropriate sections of Component 20D.

Above-Grade Dismantlement

Dismantlement of this component will generate structural steel and pipe. Concrete support footings will be left in place and removed with other at- and below-grade materials by the SCEP Area 4A excavation project.

3.12 Component G-008 Pipe Bridges

Background

The pipe bridges are steel structures which support the steam lines and other lines required for process support activities which took place in the Plant 6/EW Complex components. The pipe bridges associated with the Plant 6/EW Complex are approximately 850 linear feet running from Building 82A westward to "D" Street, north to 2nd Street, and eastward to "E" Street. Refer to drawing 06X-5500-X08262 for exact scope.

E 2203

Remedial Tasks

Three remedial tasks are anticipated for the exterior pipe bridge and associated piping, conduit, and equipment that reside within the Plant 6/EW Complex project area.

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Facility/Safe Shutdown

Facility/safe shutdown activities will consist of de-energizing all electrical utility services, disconnection and isolation of steam lines, and disconnecting water/condensate lines. No hold-up materials are present in this component.

Asbestos Removal

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Asbestos removal will consist of removing insulation from pipes and steam lines. Individual asbestos work areas will be established around appropriate sections of Component G-008. The ACM is in good condition and has not caused any areas to be designated as asbestos areas because of the concern for friable asbestos. Approximately 1523 linear feet of pipe insulation on 4" - 8" diameter pipe and 350 linear feet of pipe insulation on 10" - 12" diameter pipe will be removed as part of the asbestos removal activity.

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Above-Grade Dismantlement

Dismantlement of this component will generate structural steel, pipe and conduit. Concrete support footings will be left in place and removed with other at- and below-grade materials by the SCEP Area 4A excavation project.

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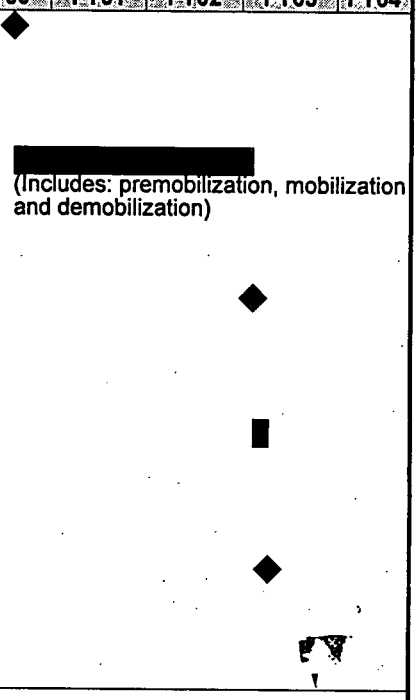
4.0 SCHEDULE

This section presents the planning and implementation schedules for the Plant 6/EW Complex D&D project. Figure 4-1 presents the schedule for implementation of field activities beginning with the Contractor's Notice To Proceed (NTP) and ending with the submittal of the Project Completion Report. The schedule shown in Figure 4-1 was developed based on the inclusion of all the components listed in Section 1.2 into the D&D contract. Within Figure 4-1, the primary milestones of the project include NTP, project completion ("Completion of Field Activities"), and the preparation and submittal of the Project Completion Report to U.S. EPA and Ohio EPA.

Activity Description	Early Start	Early Finish	Orig Dur
NOTICE TO PROCEED	16MAY00*		0
FIELD REMEDIATION OF PLANT 6/EW COMPLEX	16MAY00	19NOV02	918
COMPLETION OF FIELD ACTIVITIES		19NOV02	0
PREPARE PROJECT COMPLETION REPORT	20NOV02	18JAN03	60
SUBMIT PROJECT COMPLETION REPORT TO US/OEPA		18JAN03	0



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Project Start 01OCT97
Project Finish 18JAN03
Data Date 31DEC97
Run Date 27APR99
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Early Bar
Progress Bar

P6IP

Sheet 1 of 1

OPERABLE UNIT 3 D&D SCHEDULE
PLANT 6/EW COMPLEX D&D

60

FIGURE 4-1 Plant 6/East Warehouse Complex Remediation Schedule

5.0 MANAGEMENT

The implementation of the Plant 6/EW Complex D&D project will be performed through a coordinated effort by the D&D Contractor, FEMP Project Management and support organizations, and DOE Project Management. Section 7 of the OU3 Integrated RD/RA Work Plan provides the overall management structure applied to this remediation project. A description of project-specific management responsibilities has been highlighted for the Plant 6/EW Complex in this section.

DOE will provide direct project oversight in two ways, both of which become a concerted effort to ensure that remedial activities are performed according to project specifications and requirements. The DOE Office of Safety Assessment has assigned a Facility Representative from the Fernald Area Office whose responsibilities will be to perform independent field oversight of all remedial activities performed under this project. This individual will be responsible for weekly coverage of all field activities and necessary reporting to the DOE Program Manager at the Fernald Area Office. The Facilities Representative will have the authority to stop work if conditions warrant such action. DOE Fernald Area Office will also conduct field oversight in the areas of construction, engineering, quality assurance, and health and safety. The DOE Facilities Representative and others will immediately notify the DOE Project Manager of any issues or problems that arise in an effort to seek prompt resolution.

The DOE Project Manager and the environmental management contractor, Fluor Daniel Fernald, will oversee the remedial action through its project team review and approval process and by performing the following functions:

- ensuring that the Contractor is provided with the proper direction and support necessary to meet the remedial action objectives for this project;
- detailing all work conditions and scope requirements;
- conducting an alignment meeting where all project personnel will be instructed on the Safe Work Plans, pre-construction meetings, daily pre-work scope and safety briefings, and weekly coordination meetings with the Contractor to address all concerns, schedule status, planning, progress, and deviations;
- performing quality assurance and quality audits of all remediation tasks to determine adherence to work scope conditions;

- verifying work is performed in compliance with approved health and safety plans;
- performing pre-final and final inspections; and

2203

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- manage D&D of the components, material sizing, segregation, and loading into containers and/or stockpiling. Container transport to and from the project area will be performed by FEMP Waste Management personnel.

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REFERENCES

U.S. Department of Energy, 1993, *Operable Unit 3 Remedial Investigation and Feasibility Study Work Plan Addendum*, Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1995, *Plant 7 Dismantling - Removal Action No. 19*, Final Report, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996a, *Operable Unit 3 Remedial Investigation and Feasibility Study Report*, Final, prepared by Fernald Environmental Restoration Management Corporation, Cincinnati, Ohio.

U.S. Department of Energy, 1996b, *Operable Unit 3 Record of Decision of Final Remedial Action*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1996c, *FEMP Stormwater Pollution Prevention Plan*, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997a, *Operable Unit 3 Integrated Remedial Design/Remedial Action Work Plan*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997b, *Integrated Environmental Monitoring Plan*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997c, *Building 4A Project Completion Report*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

U.S. Department of Energy, 1997d, *Plant 1 Complex - Phase I Project Completion Report*, Final, prepared by Fluor Daniel Fernald Corporation, Cincinnati, Ohio

2203

APPENDIX A

PROPOSED SAMPLING

Several types of sampling were identified early in the design process to support both the design itself and to support logistical planning for field remediation. The scope and requirements for potential D&D sampling were outlined in the Sampling and Analysis Plan, included as Appendix D to the OU3 Integrated RD/RA Work Plan. A project-specific summary of the sampling types is included below.

Characterization Screening

Lead screening was conducted during the OU3 RI/FS using X-Ray Fluorescence (XRF) screening of media for lead based paint. No additional XRF screening was required to support D&D design. Radiological surveying has been conducted for fixed and removable radioactive contamination using Geiger-Mueller radiological contamination meters and will continue to be used throughout D&D activities to verify that radiological facility release criteria (i.e., release from containment) are met. Equipment and materials being removed from the project contamination area during demobilization will be surveyed for radiological contamination.

Asbestos

This category represents samples that have been collected to verify whether a certain material is considered ACM and whether the ACM is regulated or non-regulated. Asbestos surveys were conducted prior to the design of this D&D project and the results were incorporated. Section 2.1 presents a summary of the friable ACM results. It is not anticipated that additional asbestos bulk samples will be needed during D&D. Asbestos air sampling will be performed during asbestos abatement.

Secondary Waste (Decontamination Water)

It is expected that up to 75,000 gallons of decontamination washwater could be generated during equipment cleaning. Samples will be used to determine the need for treatment prior to discharge into the AWWT. Based on the washwater volume estimate, nine samples would be

needed to characterize washwater for isotopic radionuclides and heavy metals, and an estimated 10 samples would be needed to evaluate enrichment (i.e., levels of U-235 to total Uranium).

A project-specific sampling plan for the decontamination washwater will be developed after decontamination washwater is generated but prior to actual sampling. An example of a typical wastewater sampling plan is attached to Appendix D of the OU3 Integrated RD/RA Work Plan.

Nevada Test Site (NTS) Confirmatory

To qualify debris for NTS shipment, one percent of each material/waste stream going to NTS will be sampled. For each container that makes up the one percent, three samples will be taken and analyzed in accordance with the NTS Waste Acceptance Criteria (WAC).

Permitted Off-site Commercial Disposal Facility

Sampling is anticipated from potential mixed waste sludge that will be collected from the settling of decontamination washwater and associated filtercake. Mixed waste may result from the collection of lead-based paint in the filtrate. Sampling and analysis required for shipment certification will be as specified by the permitted facility's WAC. Section 3.2.3 of the SAP contained in Appendix D of the OU3 Integrated RD/RA Work Plan addresses analytical requirements for off-site disposal.

Asbestos Air Monitoring

Asbestos air sampling will be necessary since friable ACM will be removed prior to dismantlement under controlled abatement methods per Specification Section 01516. Occupational air sampling for asbestos will be performed as required by OSHA standards.

Radiological Air Monitoring

Data from the IEMP site-wide routine environmental air monitoring program will be used to complement the occupational air monitoring program. Per the FDF Radiological Control Requirements Manual, occupational air (i.e., breathing zone) samplers will be worn by approximately twenty-five percent (25%) of the workers in each work group/crew (minimum of one worker) when performing airborne generating activities in a contamination area, high contamination area, or an airborne radioactivity area.

APPENDIX B 2203

EVALUATION OF MATERIAL DISPOSITION ALTERNATIVES FOR THE PLANT 6/EW COMPLEX

Per the OU3 Record of Decision for Final Remedial Action, the selected disposition route for the majority of OU3 radiologically contaminated material, including accessible metals, is placement in the On-Site Disposal Facility (OSDF). However, in support of DOE's commitment to evaluate recycling on a case-by-case basis during each above-grade D&D project design (per Section 3.3.6.1 of the OU3 Integrated Remedial Design/Remedial Action Work Plan under the subheading of Unrestrictive Release Recycling/Reuse), an evaluation of disposition alternatives was performed for potentially recyclable/reusable materials estimated to be generated from the Plant 6/EW Complex. Using the Decision Methodology for Fernald Material Disposition Alternatives (the "Decision Methodology"), which was finalized in July 1997 following extensive stakeholder involvement, 1,495 tons of potentially recyclable accessible metals (OU3 Debris Category A) from all Plant 6/EW Complex components was evaluated by comparing the four leading alternatives to on-site disposal.

The Decision Methodology consists of three phases: 1) Threshold Phase; 2) Life Cycle Analysis Phase; and 3) Decision Phase. The first phase, the Threshold Phase, includes a comparative evaluation of project costs for each alternative. The cost estimates which were established under the Plant 4 Case Study (presented during July 8, 1997 public meeting; cost data dated from September 27, 1996) were utilized for the 1,495 tons of structural steel from the Plant 6/EW Complex. Since total cost estimates for each recycling alternative are current, and other factors such as vendor and market information have not significantly changed since the Plant 4 evaluation was performed, unit rates for each of the recycling alternatives shown in the Plant 4 Case Study are considered valid for the Plant 6/EW Complex alternative disposition alternative evaluation. The total cost comparison of the disposition alternatives is shown in Table B-1.

TABLE B-1 Total Cost Comparison for Disposition Alternatives

Disposition Alternative	Cost Per Pound	Total Cost	Percent Above Lowest Cost
On-Site Disposal Facility	$ 0.04	$119,600	--
Vendor Material Release Facility	$ .41	$1,225,900	1025 %
FEMP Material Release Facility	$ 0.97	$2,900,300	2425 %
"Recycle 2000"	$ 1.20	$3,588,000	3,000 %
Privatized FEMP Material Release Facility	$ 0.56	$1,674,400	1,400%

The comparison of total costs between disposal in the OSDF and the four recycling alternatives indicates that each of the recycling alternatives greatly exceeds the 25 percent total cost criteria established for the Threshold Phase. As a result, only the lowest cost alternative (i.e., on-site disposal) meets the minimum criterion defined for the Threshold Phase. Therefore, as identified in the Decision Methodology, no further consideration of these decision alternatives is warranted and the disposition decision the estimated 1,495 tons of accessible metals is disposal in the OSDF. Should vendor or market conditions change significantly prior to OSDF disposal of the structural steel, whereby the total costs of any of the recycling alternatives approach the cost threshold for further evaluation, then an re-evaluation of the disposition alternatives would be considered.

2203

APPENDIX C

PERFORMANCE SPECIFICATIONS

The project specification included in this appendix represent a modified version of the original set of performance specifications contained in the May 1997 final version of the OU3 Integrated RD/RA Work Plan. These project-specific specifications incorporate lessons-learned from previous D&D projects at the FEMP and identify new and innovative technologies and methods that are applicable to the Plant 6/EW Complex D&D project.

68

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PLANT 6/EAST WAREHOUSE COMPLEX

DECONTAMINATION AND DISMANTLEMENT PROJECT

ENGINEERING PERFORMANCE SPECIFICATIONS

ENGINEERING SPECIFICATIONS 1763-TS-0001

FLUOR DANIEL FERNALD

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FLUOR DANIEL FERNALD
P. O. BOX 538704
CINCINNATI, OH 45253-8704

70

E- 2203

PLANT 6/EAST WAREHOUSE COMPLEX

DECONTAMINATION AND DISMANTLEMENT PROJECT

ENGINEERING PERFORMANCE SPECIFICATIONS

(EE-SPECIFICATIONS 1763-TS-0001)

EFFECTIVE DATE: MARCH 19, 1999

ORIGINATOR:_____
(RESPONSIBLE ENGINEER) DATE

APPROVAL:_____
(PLANT 6/EAST WAREHOUSE COMPLEX D&D PROJECT MANAGER) DATE

DESIGN VERIFICATION:_____
(FDF ENGINEERING) DATE

FLUOR DANIEL FERNALD

FERNALD ENVIRONMENTAL MANAGEMENT PROJECT

FLUOR DANIEL FERNALD
P. O. BOX 538704
CINCINNATI, OH 45253-8704

71

PLANT 6/EAST WAREHOUSE COMPLEX
DECONTAMINATION AND DISMANTLEMENT PROJECT
ENGINEERING PERFORMANCE SPECIFICATIONS

TABLE OF CONTENTS

SECTION	TITLE	REV.	DATE
DIVISION 1 - GENERAL REQUIREMENTS			
01010	GENERAL REQUIREMENTS	0	3/19/99
01120	DEBRIS/WASTE HANDLING CRITERIA	0	3/19/99
01515	MOBILIZATION, DEMOBILIZATION, AND GENERAL SITE REQUIREMENTS	0	3/19/99
01516	ASBESTOS ABATEMENT	0	3/19/99
01517	REMOVING/FIXING RADIOLOGICAL CONTAMINATION	0	3/19/99
01519	DECONTAMINATION OF CONTRACTOR PROVIDED TOOLS, EQUIPMENT AND MATERIALS	0	3/19/99
DIVISION 2 - (NOT USED)			
DIVISION 3 - CONCRETE			
03315	CONCRETE/MASONRY REMOVAL	0	3/19/99
DIVISION 4 - MASONRY (COMBINED WITH DIV. 3 - CONCRETE)			
DIVISION 5 - METALS			
05125	NEW STRUCTURAL STEEL/METALS	0	3/19/99
05126	STRUCTURAL STEEL DISMANTLEMENT	0	3/19/99

SECTION	TITLE	REV.	DATE
DIVISION 6 - (NOT USED)			
DIVISION 7 - THERMAL AND MOISTURE PROTECTION			
07415	TRANSITE REMOVAL	0	3/19/99
DIVISION 8 - 12 (NOT USED)			
DIVISION 13 - SPECIAL CONSTRUCTION SYSTEMS (NOT USED)			
DIVISION 14 - CONVEYING SYSTEMS (NOT USED)			
DIVISION 15 - MECHANICAL			
15065	EQUIPMENT/SYSTEM DISMANTLEMENT	0	3/19/99
15067	VENTILATION AND CONTAINMENT	0	3/19/99
DIVISION 16 - (NOT USED)			

SECTION 01010

GENERAL REQUIREMENTS

PART I GENERAL

1.1 SUMMARY

A. The intent of these specifications is to establish technical requirements necessary to support the above-grade decontamination and dismantlement (D&D) of the structures and components at the Fernald Environmental Management Project (FEMP).

B. In all cases where the terms "Vendor", "Seller", "Manufacturer", or similar terms appear in these specifications or in the appendices to these specifications, they shall be understood to refer to an individual or firm(s) providing materials, equipment or services, as noted, under a contract to Fluor Daniel Fernald (FDF).

C. In all cases where the term "Contractor" appears in these specifications, it shall be understood to refer to the Contractor and their subtier contractors who are performing the D&D services at the FEMP.

D. In all cases where the words "FEMP Project Manager" or "Construction Manager" appear, they shall be understood to refer to FDF.

E. General: The technical specifications are of the abbreviated, simplified, or streamlined type and include incomplete sentences. Omissions of words or phrases such as "the contractor shall," "in conformity therewith," "shall be," "as noted on the drawings," "according to the plans," "a," "the," and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings.

For convenience of reference and to facilitate the letting of contracts, the specifications may be separated into titled divisions. The following defines the separations referred to in the specifications:

1. Division: Separate numbered division of specifications (e.g., Div. 16)
2. Section: Separate numbered section of a division (e.g., Sec. 16020)
3. Article: Separate numbered article of a subsection (e.g., Article 2.1)

F. Definitions: Certain terms and words as used throughout the specifications shall be defined as follows, unless otherwise particularly specified:

1. "Provide": Furnish and install, complete, in place.

2. "Indicated": As shown on the drawings and/or specified.

3. "Directed," "Authorized," "Permitted": Shall be as directed, authorized, or permitted by FDF.

4. "Selected": Shall be as selected by the Contractor or FDF.

5. "Satisfactory," "Acceptable": Satisfactory or acceptable to FDF.

6. "Necessary," "Required," "Suitable": As necessary, required, or suitable for the intended purpose as determined by FDF.

7. "Submit": Submit to FDF unless otherwise specified.

8. "Above-grade": Refers to first, second, third, etc., stories of a facility, and accessible materials/equipment in basements, sumps, pits, and trenches of a facility.

9. At- and Below-grade: Slab, and/or basement, foundation, loading docks, etc.

10. In all cases where the words "or equal" appear in these specifications, they shall be understood to mean "or approved equal."

1.2 REFERENCES, CODES, AND STANDARDS

A. All work shall be accomplished in accordance with the code requirements listed below. References to specific codes, regulations, standards, or other criteria documents in these specifications are indicated as the latest edition of revision of each document, as of the date when these specifications were prepared. Invoking all or any part of these standards are to be accomplished in accordance with normal industry practices. Standards listed in this section can be used in their entirety or applicable sections depending on their application to the services being rendered by the Contractor.

1. Ohio Basic Building Code (OBBC) 1994.

2. Life Safety Code 101A - 1998.

3. Other applicable National Fire Protection Association (NFPA) Codes - All inclusive, including 1998 revisions.

4. 29 CFR 1910 - Occupational Safety and Health Administration - Department of Labor.

5. 29 CFR 1926 - Occupational Safety and Health Administration (OSHA).

6. 40 CFR - United States Environmental Protection Agency (U.S. EPA).

7. DOE Order 440.1 - Worker Protection Management for DOE Federal and Contractor Employees.

8. DOE Order 441.1 - Radiological Protection for DOE Activities.

75

9. DOE Order 5400.5 - Radiation Protection of the Public and the Environment and 10 CFR 835 - Occupational Radiation Protection.

1.3 SUBMITTALS

A. If required in Part 6 of the Invitation for Bid/Request for Proposal (IFB/RFP), provide twelve (12) copies of a recommended operating manual or spare parts list which shall be submitted at least sixty (60) days prior to the shipment of any item of equipment.

B. An Installation, Operation, and Maintenance (IOM) Manual shall be prepared so as to provide optimum operation and maintenance of the equipment and systems being furnished.

C. The cover of the IOM Manual shall include the following information:

1. Project Title -_____.
2. Contractor.
3. Construction Manager - FDF.
4. Subtier Contractor (name, if any).

D. The IOM Manuals shall be bound into one or more volumes for ease of handling, and shall have an index. The manual shall include descriptive literature, drawings, performance curves and rating data, test reports, and spare parts lists. The maintenance section shall divide maintenance procedures into two categories, "Preventive Maintenance" and "Corrective Maintenance," and a subsection for "Safety Precaution." Preventive maintenance shall include cleaning and adjustment instructions. Corrective maintenance shall include instructions and data arranged in the normal sequence of corrective maintenance (i.e., troubleshooting, logical effect to cause), then repair and replacement of parts, then the parts list. Safety Precautions shall comprise a list of safety precautions and instructions to be followed before, during, and after making repairs, adjustments, or routine maintenance.

1.4 QUALITY REQUIREMENTS

A. The Contractor shall provide written procedures for FDF's review and approval of all tests to be performed as identified in the drawings and specifications. These procedures shall provide the detailed step-by-step operations with sign-off columns and date columns and shall be submitted and approved prior to testing.

B. The Contractor shall not deviate from construction acceptance tests as reviewed and approved by FDF.

C. All test instruments shall have been calibrated within 12 months prior to use on this contract or at intervals as recommended by vendor, by a calibration laboratory whose calibration equipment and instruments are fully traceable to National Institute of Standards and Technology (NIST) standards. The Contractor shall provide individual certification of calibration and NIST standards traceability for all test instruments used on this contract.

SECTION 01010 E 2203

1.5 ABBREVIATIONS FOR REFERENCED STANDARDS AND SPECIFICATIONS

The following list denotes abbreviations used in the technical portions of these specifications:

Abbreviation	Authority or Title
AASHTO	American Association of State Highway Transportation Officials
ACGIH	American Conference of Governmental Industrial Hygienists
ACI	American Concrete Institute
ACRI	Air Conditioning and Refrigeration Institute
ADC	Air Diffusion Council
AGC	Associated General Contractors of America
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AMCAAir	Movement and Control Association
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
AWS	American Welding Society
AWWA	American Water Works Association
CFR	Code for Federal Regulations
DHI	Door and Hardware Institute

77

SECTION 01010

Abbreviation	Authority or Title
ERDA	Energy Research and Development Administration
FGMA	Flat Glass Marketing Association
FM	Factory Mutual System
GA	Gypsum Association
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
IFB	Invitation for Bid
IMIAC	International Masonry Industry All-Weather Council
MBMA	Metal Building Manufacturers Association
NAAMM	National Association of Architectural Metal Manufacturers Association
NCMA	National Concrete Masonry Association
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NETA	National Electrical Testing Association
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
ODOH	Ohio Department of Health
ODOT	Ohio Department of Transportation
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PS	United States Department of Commerce, Voluntary Products Standards
RFP	Request for Proposal

SECTION 01010

2203

Abbreviation	Authority or Title
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Steel Structures Painting Council
UL	Underwriters Laboratories, Inc.

END OF SECTION

SECTION 01120

DEBRIS/WASTE HANDLING CRITERIA

PART I GENERAL

1.1 SCOPE

This section provides the requirements for handling, containerization and stockpiling of debris/waste generated during the dismantlement of processing and support facilities. Debris/waste shall be segregated into established categories and containerized as directed in this Specification Section. This includes, but is not limited to, the following:

A. Classification of materials by segregation category;
B. Segregation of materials;
C. Containerization/loading;
D. Movement of containers within the construction zone; and
E. Tagging containers.

1.2 RELATED SECTIONS

A. Section 01515 - Mobilization, Demobilization, and General Site Requirements.

B. Section 01516 - Asbestos Abatement.

C. Section 01517 - Removing/Fixing Radiological Contamination.

D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment, and Material.

E. Section 03315 - Concrete/Masonry Removal.

F. Section 05126 - Structural Steel Dismantlement.

G. Section 07415 - Transite Removal.

H. Section 15065 - Equipment/System Dismantlement

I. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

See Invitation for Bid/Request for Proposal (IFB/RFP) for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Contractor Safe Work Plan Format Requirements.
E. Waste Management Plan (WMP), which includes the Material Segregation and Containerization

Criteria (MSCC) form. The MSCC form identifies anticipated waste streams to be generated and their respective waste categories. In addition, the MSCC identifies containers (where applicable) for the waste streams, size criteria, and special waste handling criteria. Debris is defined as dismantled piping, equipment, systems, components, materials, etc.

1.4 REFERENCES, CODES AND STANDARDS

All work shall be accomplished in accordance with the following code and standards:

A. DOE Order 460.1A Packaging and Transportation Safety.

B. 10 CFR 835 Occupational Radiation Protection

1.5 SUBMITTALS

The Contractor shall submit the following for approval by Fluor Daniel Fernald (FDF).

A. Prior to mobilization, the Contractor shall submit a detailed debris/waste handling Safe Work Plan in accordance with IFB/RFP Contractor Safe Work Plan Format Requirements contained in Part 7 of the IFB/RFP for approval by FDF.

B. The Safe Work Plan shall include the Contractor's:

1. Method of cutting to meet debris size requirements (if different from methods used for dismantlement).
2. Proposed equipment for loading and handling containers.
3. Method to verify that the weight capacity of each container is not exceeded.
4. Method for loading containers.
5. Method for segregating waste categories.
6. Method for moving debris in and around project area (debris flow).
7. Proposed container staging areas, as required by this Section.
8. Material inspection area.

C. Monthly Container Report

A report shall be submitted identifying the current waste container stock listing of drums and white metal boxes by inventory number delivered and staged at the project site. The report shall be issued on a monthly basis. The report shall describe the usage and/or contents of the waste containers under control by the Contractor.

1.6 PROJECT CONDITIONS

A. Categories of debris/waste are identified in Part 6 of the IFB/RFP — WMP (MSCC).

B. Generation of additional debris/waste shall be minimized. Waste minimization shall include, but

not be limited to, unpacking equipment and material prior to entering the Controlled Area. The Contractor shall not bring any hazardous material to the construction zone unless prior approval is received from FDF. Alternatives to hazardous materials shall be used whenever possible.

C. The Contractor shall notify FDF immediately when hazardous or mixed wastes are found or, whenever possible, before they are generated. Further management of these wastes shall be coordinated with FDF.

D. Request for containers shall be made to FDF in writing at least 4 calendar days in advance of need.

PART II PRODUCTS

2.1 EQUIPMENT

The Contractor shall supply all equipment required for sizing debris and for moving containers, except ISO containers, within the construction zones, as well as all equipment to load containers. FDF will move ISO containers.

2.2 MATERIALS — OWNER (FDF) FURNISHED

A. FDF will provide appropriate containers for debris/waste categories as identified on the MSCC, except liquid storage tanks as noted in Section 01517 of this specification package and as otherwise specified in the IFB/RFP. These containers include, but are not limited to, the following:

Container Designation	Nominal Exterior Dimensions (HxWxL)	Maximum Gross Weight (lbs)
Large white metal box (LMB) (top load)	8'x8'x20'	42,000
ISO container (top load)	8'x8'x20'	42,000
ISO container (end load)	8'x8'x20'	42,000
Small metal box	3'x4'x6'	9,000
55-gallon drum with lid	---	882
Roll-off boxes (ROB)	6'x8'x22'	42,000

B. FDF will deliver empty ("prepped", if required) containers, pallets (possibly radiologically contaminated), dunnage, and miscellaneous materials, as required, to the container staging (also referred to in the IFB/RFP as "queuing") area.

SECTION 01120 2203

2.3 MATERIALS — CONTRACTOR FURNISHED

A. The Contractor shall supply fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage: color, yellow; minimum thickness of 6-mils; ultraviolet resistant; as manufactured by Griffolyn, Herculite or equal.

B. The Contractor shall furnish 8 ½" x 11" weatherproof removable tags.

C. The Contractor shall furnish 3.5'- 4' high woven metal fencing consisting of 14 gauge 2 inch x 4 inch galvanized welded mesh with 7 foot painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.

PART III EXECUTION

3.1 PREPARATION

A. Roll-Off Box Staging Area:

The Contractor shall establish and maintain a ROB staging area, which shall be proposed by the Contractor unless otherwise specified by FDF on reference site drawings. To define and control access to this area, woven metal fencing will be erected around the perimeter of the staging area. One section of the fence will be open for access and egress. The fencing must be maintained in good condition. This area shall be used for temporary staging of empty and full ROB containers. If the staging area is a non-concrete surface, the Contractor shall be responsible for stabilizing and maintaining the areas and routes of access to accommodate container handling requirements.

B. Other Container Staging:

The Contractor shall prepare two other container staging areas — one area will be used to store empty drums and white metal boxes (includes Sea Lands) and the other area will be used for full drums and white metal boxes — which shall be proposed by the Contractor unless otherwise specified by FDF on reference site drawings. Woven metal fencing will be erected around the perimeter of each staging area. One section of the fence for each area will be open for access and egress. The fencing must be maintained in good condition. Signs shall be posted in each storage area identifying empty or full containers.

C. Material Inspection Area:

The Contractor shall establish a material inspection area, which shall be proposed by the Contractor and approved by FDF, for each contamination area to allow FDF to inspect debris and/or perform radiological surveying. The inspection area shall be arranged such that routine access is prevented by means of fencing and/or barrier tape with appropriate posting to identify that the items contained are being held for visual inspection survey or radiological, and the area is off-limits to individuals other than FDF/Contractor waste technicians and radiological survey personnel.

SECTION 01120

3.2 APPLICATION

A. Debris handling requirements are defined by the following FDF classifications: 1) non-process debris; 2) process debris; and 3) suspect process debris. All debris shall be sized, segregated, and containerized in accordance with Part 6 of the IFB/RFP, WMP.

1. Non-Process Debris:

Non-process debris will be exempt from the inspection requirement for *visible process residues* as described in Article 3.2.A.4 of this Specification Section. Non-process debris would include, but are not limited to, piping for utility systems (i.e., steam, condensate, drinking water, air, and others), electrical systems (i.e., conduit, motors, electrical panels, and others), and obvious non-process items such as structural steel (Debris Category A), concrete (Debris Category E), transite (Debris Category G), and most miscellaneous materials categorized as Debris Category I. Surface decontamination of non-process debris per Specification Section 01517, Article 3.1 applies.

2. Process Debris:

Process debris is defined as debris that fails the inspection for *visible process residues* per Article 3.2.A.4.a. and debris listed in the MSCC (located in the WMP, Part 6 of the IFB/RFP) as Debris Category C. Process piping and debris predetermined to be Debris Category C in the MSCC will be exempt from the inspection for *visible process residues* (described below in Article 3.2.A.4) and decontamination of internal surfaces; however, the applicable provisions under Article 3.1 of Specification Section 01517 still apply.

3. Suspect Process Debris:

Suspect process debris, which includes all other debris not specifically identified as non-process debris or process debris, shall be subject to inspection by FDF per Article 3.2.A.4 to determine the presence or absence of *visible process residues*.

4. Visible Process Residue Inspection Requirements:

The definition of *visible process residues* (green salt, yellow cake, black oxide, etc.) is hold-up/materials on the interior or exterior surfaces of debris that is obvious and that if rubbed, would be easily removed. Dirt, oil, grease, stains, rust, corrosion, and flaking do NOT qualify as visible process residues; however, dirt, oil, grease, stains, rust, corrosion, and flaking require decontamination for radiological control purposes prior to removing the debris from the enclosure or prior to opening a building to the environment per Specification Section 01517. Regardless of whether or not visible process residues are present, all debris are still considered to be radiologically contaminated unless otherwise specifically identified.

FDF visual inspection will take place following dismantlement, sizing, and prior to sealing of openings in accordance with Specification Section 15065, decontamination in accordance with Article 3.1 of Specification Section 01517, and relocation to the FDF-approved inspection staging area referenced in Article 3.1.C.

a. Debris That Fails Inspection for Visible Process Residues:

1. Non-Pipe Debris: Debris that fails the inspection criteria for visible process residues will be identified with yellow paint by FDF and the Contractor shall attempt to remove the visible process residues at least one time in accordance with Specification Section 01517 prior to FDF reinspection. If the debris fails the second inspection for visible process residues, it shall be deemed as "Process Debris" (Debris Category C) and will be identified with red paint by FDF.

2. Pipe: Piping that fails the first inspection criteria for visible process residues will be deemed as "Process Debris" and will be identified with red paint by FDF. The ends of process pipe shall be sealed per Specification Section 01517, Article 3.1.B.1; decontamination of internal surfaces shall not be performed. The requirement for decontamination of external surfaces per Article 3.1 of Specification Section 01517 still applies.

b. Debris That Passes Inspection for Visible Process Residues:

Debris that passes the FDF inspection for visible process residues shall be identified with green paint by FDF. The debris then shall be containerized or staged according to Part 6 of the IFB/RFP and Article 3.5 of this Specification Section.

B. The Contractor shall be responsible for retrieving empty containers from the container staging areas (except for ISO containers), segregating debris/waste, loading, securing containers, tagging for on-site movement, and moving containers back to the designated container staging area. The Contractor shall use the MSCC as the basis of all containerizing activities and shall be responsible for minimizing debris/waste generation by limiting the amount of material brought on site.

C. Equipment, material or debris requiring movement outside the enclosed building to be sized, containerized or palletized, must meet the requirements for removal/fixing of radiological contamination per Specification Section 01517. If the removal/fixing requirements cannot be met, the material may be encapsulated or wrapped in fiber-reinforced sheeting and sealed prior to movement to prevent the migration of radioactive contamination.

Palletized equipment, material or debris shall be managed by the Contractor as follows:

1. Place fiber-reinforced sheeting over pallet, position material on pallet, and wrap the sheeting over material.

2. Secure fiber-reinforced sheeting over material to prevent migration of contamination.

3. Secure material to pallet with vinyl or metal banding material; however, transite panels shall be banded first, then placed on pallets.

3.3 PERFORMANCE

A. Loading of Containers:

1. FDF must be present during all loading of Sea Lands and Roll-off Boxes. The Contractor shall provide notice to FDF at least 24 hours prior to loading of these containers.

2. Provide a debris/waste handling supervisor to supervise operations. The supervisor shall be required to complete (FDF conducted) Nevada Test Site Waste Acceptance Criteria/Waste Certification Program Plan (NTSWAC/WCPP) training.

3. Segregate and containerize all debris/waste according to the categories defined in the MSCC. Should a debris/waste stream be discovered that is not on the MSCC, then work on the handling of this debris/waste will stop, whereupon FDF shall be contacted for further direction.

4. Commingle Debris Categories A, B, D (except for lead), and incidentally generated E in the designated container or stockpile, as directed by the MSCC. Debris Category I shall be segregated and containerized according to two subcategories: I2 — Non-compressible and/or Non-organic Misc. Debris; and I4 — Compressible and/or Organic Misc. Debris.

5. Upon receipt of containers, the Contractor shall perform a visual inspection to ensure that the containers do not contain any of the prohibited items identified in this Section. Should any containers contain freestanding liquids (ice is considered a freestanding liquid) upon delivery or removal from the work zone, FDF will remove liquids if any is found.

6. Fill containers, boxes, and drums such that the interior volume is as efficiently and compactly loaded as practical up to the maximum gross weight limit of the container. Fill void space in large piping, equipment, containers, etc., with smaller debris. Any container exceeding maximum allowable gross weight shall have contents removed, as required, to lower the weight to an acceptable range. Contents shall be prepared for containerization so as to minimize load shifting or damage to container during movement.

7. Except during loading activities, empty white metal boxes and drums must remain in the established empty container staging area.

8. The following "Prohibited Materials List" shall be displayed in the containerization area or on each container. Notify FDF if any of the prohibited materials are identified for specific material handling directions.

PROHIBITED MATERIALS LIST

a. Compressed gases (e.g., cylinders, unpunctured aerosol cans);
b. Explosives;
c. Free liquids;
d. Fine particulates (respirable fines);
e. Hazardous waste;
f. Corrosive materials;

g. Etiologic agents;
h. Flammable liquids or combustible solids; and
i. Whole or shredded scrap tires.

9. The Contractor shall install weatherproof removable tags on each debris/waste container prior to loading. Tags shall identify container contents, using indelible ink, by debris/waste category specified in the MSCC and the debris/waste's building of origin. For Category J Debris, an exact description of the contents is required.

10. Thorium contaminated debris/waste shall be containerized separately from non-thorium contaminated debris/waste.

B. Security and Movement of Containers:

To ensure security and movement of containers, the Contractor shall:

1. Move containers to the specific task location from the container staging area.

2. Ensure that the lid, doors, or tarps on debris/waste containers are secured when no containerization is in progress to prevent unauthorized containerization of materials or release of container contents. Containers must be weather protected when lid is not secured, to prevent entry of snow and rain or release of container contents.

3. Inspect all containers, double bagged materials, drums, boxes, or double wrapped components for exterior contamination and damage before removing them from the work area. Damaged containers shall be reported to FDF.

4. Secure full containers.

a. End-loading ISO containers shall be secured by closing and latching doors, ensuring that all latching mechanisms are engaged.

b. Drums shall be secured as follows:

1. Place lid on drum, ensuring that gasket is seated to maintain a tight seal.
2. Install bolt-type lock ring on lid and torque to 45 ± 5 foot-pounds.
3. Drums shall be securely strapped together on pallets, using at least one strap.

c. Top-Loading Metal boxes (large and small) shall be secured as follows:

1. Inspect gasket for damage and repair, if required.
2. Place gasket and lid on the box and secure with clamping device or pins.

d. Roll-Off Boxes (ROBs) shall be secured as follows:

1. Cover ROB with tarp or steel lid.
2. Secure tarp (with straps) or steel lid (with clamping device or pins).
3. Secure all gate chains.

4. Ensure that containers have not been damaged during loading.

e. Prior to securing lid or doors on containers holding asbestos-containing materials (ACM), fold fiber-reinforced sheeting over ACM and seal with tape.

f. Return full, secured containers to the staging area (except for ISOs, which will be removed by FDF).

g. Filled ROBs must remain inside the established staging area until they can be removed by FDF.

h. Filled drums and white metal boxes must remain inside the established full container staging area until they can be removed by FDF.

i. The Contractor shall decontaminate waste containers, equipment, tools, etc., prior to exiting the construction zone or staging area as necessary in accordance with Specification Section 01519.

C. Stockpiling of Materials:

1. The Contractor shall construct and manage debris stockpile area(s) with run-off controls, as required by Specification Section 01515, and fencing. The Contractor shall ensure that run-off controls are constructed and used in accordance with Specification Section 01515. Stockpiled materials shall be sized and segregated in accordance with the MSCC located in Part 6 of the IFB/RFP. Structural steel shall be stacked in a unidirectional manner and all materials shall be placed in a stable configuration. A five foot buffer area shall be maintained between the footprint (and vertical plane) of the stockpile(s) and the perimeter of the pad(s) and the stockpile area fencing. The Contractor shall inspect the stockpile area(s) and report any deficiencies to FDF. Inspections shall be documented in the Contractor's Daily Work Activities Report and shall include at least the following:

a. Daily and after storm events with heavy rains and/or strong winds to ensure that piles remain in a safe and controlled configuration;

b. Covers of catch basins to ensure that they remain unclogged and free of obstructions;

c. Diking to ensure that controls are in good condition, permitting easy flow of runoff; and

d. Perimeter fencing, gates, and other materials required for maintaining project control of the stockpile area(s).

2. FDF will perform routine radiological contamination surveys and airborne radioactivity monitoring. If deemed necessary by FDF, the Contractor shall take measures to mitigate the spread of contamination to areas outside of the staging area and to maintain airborne radiological levels within allowable limits. These measures may include area decontamination, application of fixatives, or other measures proposed by the Contractor and accepted by FDF.

3. Floor Load Capacity:

   If the Contractor chooses to stage any debris on a floor other than a slab-on-grade a structural engineering analysis shall be required. It shall be the Contractor's responsibility to perform the analysis to verify the loading capacity of said floor and submit the analysis to FDF signed and stamped by a Professional Engineer (PE) registered in the State of Ohio to ensure that the load capacity is not exceeded.

3.4 FIELD QUALITY ASSURANCE

The Contractor and FDF shall inspect filled containers upon their return to the container staging area to verify that no damage has occurred during the filling of the container and that materials/debris are segregated and sized according to the MSCC.

END OF SECTION

SECTION 01515

MOBILIZATION, DEMOBILIZATION AND GENERAL SITE REQUIREMENTS

PART I GENERAL

1.1 SUMMARY

A. This section consists of the work related to Contractor mobilization and demobilization. The principal items included in this section are:

1. Site access.
2. Patching building slab.
3. Construction utilities.
4. Signs and barriers.
5. Potential use of existing overhead bridge cranes.
6. Gravel pads for access and queuing areas.
7. Protecting adjacent facilities and components.
8. Stormwater control.
9. Debris chutes.
10. Remediation equipment.
11. Ventilation and containment.

B. Supplied by Owner:

1. FDF shall supply signs, barriers, fencing, and tape indicating radiological control zones for Contractor installation.

2. FDF will provide electrical power and water to the locations indicated on reference site drawing listed in Part 7 of the IFB/RFP.

C. Supplied by Contractor:

The Contractor shall supply construction zone fencing. Construction zone fencing shall meet the material specifications stated in Article 2.1.C of this Section.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

D. Section 01519 - Decontamination of Contractor Provided Tools, Equipment and Materials

C. Section 03315 - Concrete/Masonry Removal.

D. Section 05126 - Structural Steel Dismantlement.

E. Section 07415 - Transite Removal.

F. Section 15065 - Equipment/System Dismantlement.

G. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

See the Invitation for Bid Package/Request for Proposal (IFB/RFP) for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.

1.4 REFERENCES, CODES AND STANDARDS

The entire work under this section shall be in compliance with the provisions of the following:

A. American Society of Testing and Materials (ASTM):

1.	ASTM A36	Standard Specification for Carbon Structural Steel.
2.	ASTM C109-93	Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
3.	ASTM C136-93	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates (AASHTO T27).
4.	ASTM D698-91	Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbs/ft.).
5.	ASTM C1042-91	Standard Test Method for Bond Strength of Latex Systems Used with Concrete by Slant Shear.

B. National Fire Protection Association (NFPA):

1.	NFPA 70	National Electrical Code, 1996 Edition.
2.	NFPA 101A-98	Code for Life from Fire in Buildings and Structures.

C. American National Standards Institute (ANSI):

1.	ANSI C2-93	National Electrical Safety Code.
2.	ANSI C135.1-79	Galvanized Steel Bolts and Nuts for Overhead Line Construction.
3.	ANSI 05.1-92	Wood Poles Specifications and Dimensions.

D. American Wood-Preservers Association (AWPA): AWPA C4-95 Poles, Pressure Treatment

E. National Electrical Manufacturers Association (NEMA):

1. NEMA LA 1-92 Surge Arresters.

2. NEMA WC 7088 Cross-Linked-Thermosetting Polyethylene-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

F. Underwriters Laboratories (UL):

1. UL 96-94 UL Standard for Safety Lightning Protection Components.

2. UL Electrical Directories, 1995 Construction Materials.

G. United States Department of Agriculture, Soil Conservation Service: Water Management and Sediment Control in Urbanizing Areas.

H. Code of Federal Regulations (CFR):

1. 29 CFR 1926 Occupational Safety and Health Administration, Dept. of Labor (as applicable).

2. 29 CFR 1910 Occupational Safety and Health Administration, Dept. of Labor (as applicable).

I. American Water Works Association (AWWA): AWWA C506-78 — Backflow Prevention Devices-Reduced Pressure Principle and Double Check Valve Types

J. Ohio State Plumbing Code: 4104:26:105 Backflow

1.5 SUBMITTALS

The Contractor shall submit a Mobilization Safe Work Plan for approval by Fluor Daniel Fernald (FDF) that shall include the following:

A. Drawings and Data:

1. Detail and layout drawings showing locations of any barriers and/or fencing the Contractor will use for construction zone and radiological control boundaries as well as for protection of adjacent structures.

2. Detail and layout drawings showing temporary structures, access and roadways required during mobilization of major equipment components (e.g., cranes, field offices, tool and equipment storage, chutes within the stated limits of the construction zone). This shall include personnel and vehicle traffic flow patterns into and within the construction zone.

3. Drawings showing layout, details and applicable equipment, or plans the Contractor will employ to control fugitive emissions, storm water runoff, erosion, and migration of liquids.

4. Detail and layout drawings showing lay down areas, building vestibule sizes and locations, cutting areas and, as required by Specification Section 01120, container staging areas, material inspection area, and debris stockpiling area.

5. Shop drawings for all debris chutes to be used.

   a. Provide manufacturer's data or calculations to verify that the chute, its support system and the existing structure (if the debris chute is attached) can withstand all dynamic impact loads they will be subjected to during dismantlement operations.

   b. Debris chute drawings and calculations submitted must bear the stamp of a Professional Engineer registered in the State of Ohio.

B. Temporary utilities (such as water, steam, electric power) from the point source location identified on the reference site drawings in Part 7 of the IFB/RFP to end use locations.

C. Portable heating systems.

D. Verification that the patching grout compressive and bond strengths are in accordance with ASTM C109 and ASTM C1042, respectively.

E. Results of the Engineering Survey per 29 CFR 1926.850 (If any building or if part of a building to be dismantled is identified in the Contractor's engineering survey as being structurally deficient, the Contractor shall include in the Safe Work Plan proposed methods to shore the structure so that safety of the workers is maintained).

F. Written statement that Contractor accepts the condition of utilities isolation.

1.6 SITE CONDITIONS

Utilities: Except for external power being supplied to several sumps, all electric, gas, water, steam, sewer, and/or other service lines to the building have been disconnected and/or capped.

PART II PRODUCTS

2.1 MATERIALS

A. Patching Grout: Non-shrink type, premixed compound consisting of non-metallic aggregate; cement; water reducing and plasticizing agent; capable of developing minimum compressive strength of 5,000 psi in 28 days; capable of developing a bond strength of 1,200 psi in 28 days; conforming to ASTM C 109 and ASTM C827.

SECTION 01515

1. Acceptable products and suppliers:

   a. Masterflow 713, by Masters Builders.
   b. SikaGrout 212, by Sika Corp.
   c. Sealtight 588, by W. R. Meadows.
   d. Approved equal.

2. The "approved equal" products shall be approved by FDF prior to use on the FEMP.

B. Construction Zone fencing shall meet the requirements for permanent fencing in Article 2.1.C. Gates shall be plastic yellow chain fixed to stanchions. Stanchions shall be located on grade.

C. Permanent Fencing: Permanent fencing shall be a distance of 10 feet outside of the areas to be protected and shall consist of 14 gauge 2"x4" galvanized welded wire mesh 48" high with 7 foot painted steel "T" posts embedded to a depth of 2 feet and placed at 10 foot intervals.

D. If filling of slab openings is required per Article 3.2.B of this Specification Section, clean granular fill is used to fill large openings in the base slab, including pits, large sumps, etc. This material will be supplied by the Contractor. Use of fine aggregate shall be natural river sand, bank sand or sand manufactured from stone or air-cooled blast furnace slag; washed; free of silt, clay, loam, friable or soluble materials, and organic matter; within the following limits:

Sieve Size	Percent Passing
No. 4	100
No. 50	10 - 40
No. 200	0 - 5

E. Gravel Pads for Access and Container Staging Areas

The aggregate shall be 6 - 8 inch (i.e., aggregate size) crushed limestone or gravel and compacted to form a 12 inch base.

F. Wood Utility Poles:

1. ANSI 05.1; treated southern pine poles.

2. Select poles for straightness, minimum sweeps and short crooks. FDF shall be notified of any sweeps or crooks prior to installation for determination of acceptance.

3. Preservative: ANSI 05.1 and AWPA C4, Pentachlorophenol.

4. Apply preservative to AWPA C4 with minimum net retention of 12 lbs/ft^3 (285 kg/m^3). Obtain complete sapwood penetration.

G. Pole Hardware:

1. Miscellaneous Pole Hardware: Hot-dipped galvanized after fabrication.

2. Bolts and Nuts: ANSI C135.1.

3. Butt Plate: Copper.

4. Guy Strand: High strength, seven strand steel cable galvanized to ASTM A475, Class A or B.

5. Guy Termination: Preformed dead-end grip clamp type.

6. Guy Guards: 8 foot (2 m) long plastic, colored yellow.

7. Ground Wire: Soft drawn copper conductors, 6 AWG minimum size.

8. Air Terminal: UL 96; 18 inch copper air terminal.

9. Guy Adapter: Twin or Triple Eye.

H. Line Conductors:

Secondary Conductors: Aluminum or copper, triplex (three) cable with 600 volt cross-linked polyethylene insulation for phase conductors. Use bare messenger for grounding conductor.

I. Arresters:

1. Surge Arresters: NEMA LA 1; valve type, arranged for pole mounting, and rated 3 kv.

2. Mechanical Connectors: Bronze.

3. Wire: Stranded copper.

4. Grounding Conductor: Size to meet NFPA 70 requirements.

J. Pole Anchors: Helical screw anchor type sized for load; galvanized steel; ASTM A36/36M.

K. Backflow Prevention for Temporary Water Conditions (Reduced Pressure Type):

1. The backflow preventor shall meet Ohio State Plumbing Code 4101:26:105 Backflow and the American Water Works Association (AWWA) Standard (AWWA C506-78) for Backflow Prevention Devices.

2. Acceptable products and suppliers:

   a. WATTS 909 Backflow Preventor (FDF recommended product).

   b. Approved equal.

L. Portable Heating Systems: All portable heaters shall be Underwriters Laboratories (UL) listed or American Gas Association (AGA) certified for their intended use, and are not modified for other applications.

PART III EXECUTION

3.1 EXAMINATION

The Contractor shall perform an Engineering Survey in accordance with the requirements of OSHA 29 CFR 1926.850, approved by FDF prior to the Contractor proceeding with any work activities beyond mobilization.

3.2 PREPARATION

A. Site Access:

1. Vehicle, equipment and pedestrian access/egress shall be directed through the designated radiological control points.

2. Provide for emergency vehicles to enter the construction zone at all times.

B. Slab Openings:

1. Except for specific sumps, pits, and basement areas designated on the Civil Demolition Plan drawing (Ref. Dwg. No. 06X-5500-X-08262) that require permanent fencing, the Contractor shall fill large openings, pits, sumps, etc., with granular fill material to within 2 inches of grade. Alternatively, the Contractor may propose to use engineered covers that are capable of supporting anticipated loads during D&D. Alternatives shall be approved by FDF.

2. Portions of the Plant 6 slab, which are not identified in the Civil Demolition Plan drawing as areas to be protected with permanent fencing (at the completion of the project), are potential locations for interim storage stockpiling of contaminated debris or for staging of contaminated equipment. In those areas, the slab openings (conduit, piping, drain openings, etc.) shall be filled and covered with patching grout. Additional requirements for potential stockpiling areas include the following:

   a. Drain water and remove loose debris from large openings in the base slab including pits, sumps, trenches, etc., prior to filling.

b. All grease, oil, dirt and other deleterious materials shall be completely removed from slab openings and handled in accordance with Section 01120 of this specification package.

c. Follow the manufacturer's recommendations for the application of patching grout.

d. Fill in damaged areas of base slab and small openings including drains, chases, small sumps, etc., with a patching grout to create a surface level with surrounding slab. Maximum allowable depression not requiring repair is 1 inch in depth.

C. Construction Utilities:

1. Prior to performing any D&D work, the Contractor shall conduct a physical survey to verify that all utilities are capped and/or controlled to the Contractor's satisfaction. The power supply to the active Plant 6 sumps and discharge system, which are located in the Plant 6 motor bay area, shall remain intact/uninterrupted during the course of D&D. Furthermore, the Contractor shall ensure that these sumps are protected and power is not interrupted during the course of the project.

2. Capacities for water and power provisions are listed in Part 6 of the IFB/RFP. The Contractor shall determine if the capacities that can be provided by FDF are adequate for their needs; if not, the Contractor shall supply any additional capacities required.

3. All electrical appurtenances required for temporary power shall be in accordance with the National Electric Code.

4. Temporary heating or cooling, if needed, shall be provided by the Contractor. Ventilation for fuel-fired heaters and adequate clearance to combustible materials, surfaces, and furnishings shall be provided according to manufacturer's recommendations. Use of LPG gas-fired heaters shall be approved by FDF. All portable continuous running of gas fired heating systems require 24 hour coverage by the Contractor.

5. The Contractor shall extend the water from the point source location to support operations or provide portable facilities as may be required. Consistent with the Ohio State Plumbing Code, as referenced in Article 1.4, the individual performing the installation, maintenance, and inspection of the backflow preventor shall be a licensed plumber and certified in the State of Ohio as a Backflow Preventor Tester. The individual who provides only the hook-up of a backflow preventor need not be a certified and licensed plumber provided that the hook-up is inspected by a certified and licensed plumber prior to system operation.

a. The Contractor shall supply, install, and maintain all backflow prevention devices (in accordance with Article 2.1 of this specification section), fittings, and valves for point source connections.

1. The contractor shall provide FDF with the backflow prevention device at least two weeks prior to installation for inspection.

2. FDF will test and approve the backflow preventor for contractor installation.

b. At the time of installation and at least every 12 months thereafter, FDF will inspect the assemblies. The Contractor shall coordinate water hook-up with FDF. FDF will activate hydrants.

c. At project completion, the Contractor shall turn all backflow prevention devices, fittings, and valves over to FDF in good working order at no additional costs.

d. Backflow devices shall have freeze protection and be accessible for inspection.

D. Signs and Barriers:

1. The Contractor shall protect manholes, catch basins, valve pits, underground utilities, post indicator valves, power poles and drains, adjacent structures, groundwater monitoring wells, existing exterior benchmarks, and survey monuments from damage. If displaced or lost, the Contractor shall reinstall at no additional cost to FDF.

2. The Contractor shall remove all existing chain link fencing and install construction zone fencing outlining construction boundary. Construction safety signs shall be posted at 50 feet intervals around the defined construction area. Fencing must be supported by posts driven into the ground. The Contractor shall regularly inspect all fences and barriers for integrity and shall perform maintenance to restore integrity in a prompt manner throughout the D&D project.

3. The Contractor shall install radiological control fencing as follows:

a. Yellow snow fence shall be installed around radiological areas in outdoor areas to designate the following boundaries:

- Contamination Area/Controlled Area;
- High Contamination Area; and
- Adjacent Contamination Areas controlled to different isotopes.

b. When yellow fence requirements coincide with an existing barrier such as a permanent fence or a building wall, the existing physical barrier may serve as the boundary.

4. Fencing for short-term work, i.e., work within the project construction zone boundary, may be supported with portable stanchions placed at no more than six feet apart. Entry points shall be established such that they may be easily opened and can be held closed. These points shall be large enough to support traffic and/or movement of waste containers. For situations where personnel access is the only need, the Contractor may utilize building doors or overlapping yellow fence that can be tied back and supported by the remaining fence while open (i.e., will not lie on the ground).

5. Permanent Fencing: Upon completion of D&D activities, the Contractor shall install permanent fencing around specific areas as identified on the Civil Demolition Plan drawing. Article 2.1.C of this Section defines the material and placement specifications. An access gate, using the same fence material, shall be installed at one location along the perimeter fencing of the area where sumps are operating to allow subsequent access by FDF. The gate shall have a latch that can be locked.

E. Potential Use of Overhead Bridge Cranes and Elevators:

Use of permanent facilities shall be in accordance with the requirements specified in the provisions for Temporary Facilities and Utilities located in Part 6 of the IFB/RFP.

F. Gravel Pads for Access and Queuing Areas:

Grading of site shall prevent ponding of water. Use a minimum slope of 1 percent. All grading will direct water toward the site's storm drainage system.

G. Protecting Adjacent Facilities and Components:

The Contractor is responsible for avoiding damage to adjacent structures, material and equipment including underground utilities during decontamination and dismantlement activities.

H. Stormwater Control:

Storm water control will be required for activities that could disturb soils or otherwise allow for release of contaminants from stockpiled debris. Storm drainage systems within the construction zone shall be maintained free and clear of debris and sediments by use of control devices, such as staked silt fences, and be maintained throughout the project.

I. Debris Chutes:

1. The Contractor shall ensure that catch platforms, chutes and other means of handling debris are properly isolated by gates or barriers designed and constructed to eliminate impact hazards and to control the flow of material to its final destination.

2. Debris chutes shall meet the requirements of 29 CFR 1926.852.

3. Debris chutes shall be fully enclosed, dust-tight and ventilated.

4. FDF may prohibit the use of a debris chute if the radiological contamination levels could result in the uncontrolled generation of airborne radioactivity.

J. Remediation Equipment:

1. Identify any special requirements for storing material or equipment.

2. To minimize the generation of waste products by the Contractor, all equipment requiring periodic oil and filter changes shall have this maintenance performed just prior to arrival on site.

3. Additional requirements for mobilization and demobilization of remediation equipment are listed in the IFB/RFP in the Project Radiological Requirements Plan.

K. Ventilation and Containment:

1. If release cleaning requirements for structures, as specified in the Radiological Requirements Plan contained in Part 8 of the IFB/RFP, is required, a vestibule on the entry/exit of the building access prior to the beginning of work shall be installed. The vestibule shall be constructed so as to prevent the escape of airborne contamination. Material used for the construction of vestibules shall be in compliance with Section 15067 of this specification package.

2. Enclose structure and ensure that all holes, gaps, openings in exterior building structure walls and roofs are sealed with duct tape, fiber-reinforced sheeting, plywood or foam material (including where doors or windows are missing) in accordance with Specification Section 15067. Enclosed structures shall allow for emergency exits.

3.4 DEMOBILIZATION AND FINAL PROJECT SITE ACCEPTANCE

A. Demobilization includes the removal of all contractor tools, equipment, materials, and construction zone perimeter fencing.

B. Final project site acceptance shall be conducted by FDF in accordance with FDF Site Procedures, and will consist of verification of completion of all work activities relating to the work scope.

END OF SECTION

SECTION 01516

ASBESTOS ABATEMENT

E 2203

PART I GENERAL

1.1 SCOPE

This section specifies the requirements for an asbestos hygiene program, and methods to be used for removal, movement, and disposition of friable asbestos-containing material (ACM) and other materials contaminated with asbestos. This section does not cover transite unless panels exhibit significantly deteriorated surfaces where surfaces become friable.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01517 - Removing/Fixing Radiological Contamination.

C. Section 07415 - Transite Removal.

D. Section 15067 - Ventilation and Containment

1.3 REFERENCE MATERIALS

A. See the Invitation for Bid/Request for Proposal (IFB/RFP) Package for the following:

1. Index of Drawings.
2. Photographs.
3. Drawings.
4. Air Filter Device (AFD) Procurement Specification.
5. Air Cleaning Filter Procurement Specification.
6. Contractor Safe Work Plan Format Requirements.
7. HEPA Vacuum Cleaner Requirement.
8. HEPA Air Filtration Device Requirement.

B. ACM summary information on the project is provided in Part 6 of the IFB/RFP; however, the contractor is responsible for estimating quantities for bid/proposal and regulatory purposes.

1.4 REFERENCES, CODE AND STANDARDS

A. 29 CFR 1910 Occupational Safety and Health Administration - Dept. of Labor (as applicable).

B. 29 CFR 1926 Occupational Safety and Health Administration - Dept. of Labor (as applicable).

101

C. Ohio Department of Health Asbestos Hazards Abatement Rules Chapter 3701 - 34, OAC (Ohio Department of Health).

D. Ohio Environmental Protection Agency Chapter 3745-20, OAC.

E. United States Environmental Protection Agency (U.S. EPA) 40 CFR 61, Subpart M, (NESHAPS).

1.5 SUBMITTALS

The Contractor shall submit to Fluor Daniel Fernald (FDF) the following for approval:

A. An Asbestos Abatement Safe Work Plan, prepared by an Ohio Certified Asbestos Abatement Project Designer, in accordance with the IFB/RFP Part 7, Contractor Safe Work Plan Format Requirements, and Part 8, Asbestos Abatement Safe Work Plan Requirements and Safety and Health and Training Requirements, including the procedures proposed for use in complying with the requirements of this specification.

B. Prior to initiation of ACM work, the Contractor shall submit the following items to Fluor Daniel Fernald (FDF):

1. Ohio Department of Health/OSHA-required documentation for Asbestos Removal Contractors:

   a. Documentation of training.
   b. Medical surveillances.
   c. Respirator fit-test.
   d. Employee exposure assessments.

2. State of Ohio certificates and licenses for the Contractor.

3. State of Ohio certification for all personnel as required by law.

C. Five (5) days prior to submittal of notification to government agencies, the Contractor shall provide a copy of the notification to FDF for concurrence.

D. Product Data: The Contractor shall submit manufacturer's technical information including application instructions for each material proposed for use.

1.6 DELIVERY, STORAGE, AND HANDLING

Materials shall be in original, new, and unopened containers bearing manufacturer's name, label, and the following information:

A. Name or title of material.
B. Manufacturer's stock number and date of manufacture.

C. Manufacturer's name.
D. Thinning instructions.
E. Application instructions.

2203

1.7 SITE CONDITIONS

A. Interior transite that has deteriorated to a friable condition shall be considered friable ACM and therefore be removed in accordance with this Specification Section. Transite enclosing the former Scrap Pickling Area in Plant 6 has deteriorated to a friable condition.

B. ACM-containing materials such as floor tile, mastic, woven cloth-covered electric wire, and gaskets are present in Plant 6 and may become friable during handling; therefore such materials shall be removed pursuant to the requirements of this Specification Section.

PART II PRODUCTS

2.1 MATERIAL

A. Polyethylene sheeting: Fire retardant, clear, and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.

B. Polyethylene bags: clear and have a minimum of 6 mils thickness.

C. Outside containments: Clear, reinforced and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or equal.

D. Surfactants (wetting agents), encapsulants, and lockdowns shall be mixed in a proportion specified by the manufacturer and contain a colorant to make coverage areas readily apparent. Products that have been acceptable to FDF include those listed below. Equivalent or better products may be acceptable and shall be approved by FDF.

1. Surfactants:

   a. CP-225 CHIL-SORB by Childers.
   b. Approved equal.

2. Encapsulants:

   a. CP-240 CHIL-LOCK - Childers.
   b. Certane 2050 - Certified Technologies.
   c. Eppco #1 - Expert Environmental Products.
   d. Serpiloc - International Protection Coatings Corp.
   e. Approved equal.

3. Lockdowns:

   a. 1050 - Clearcoat by Certane.

b. Fiber-Seal - Eppert.
c. Serpiloc. - International Protection Coatings Corp.
d. Approved equal.

2.2 EQUIPMENT

A. Negative pressure Air Filtration Device (AFD) equipped with HEPA filtration and operated in accordance with the requirements of 29 CFR 1926.1101 (See Part 7 of the IFB/RFP).

B. All containments used for asbestos abatement operations shall be capable of maintaining a minimum of 0.02 inches water gauge (w.g.) of negative pressure, as recorded by manometric measurements. The ventilation system for this type of operation shall provide a minimum of four air changes per hour.

C. For mini-enclosures and glovebags, a HEPA filtered vacuum system may be substituted to provide negative air pressure. Ensure that the HEPA filtered vacuum system meets the four air changes per hour capacity required for mini-containments.

D. HEPA filtered vacuum. See Part 7 of the IFB/RFP for requirements of HEPA vacuum systems.

E. The Contractor shall supply a Portable Asbestos Hygiene Facility (See Figure 1 on the following page). The size of this facility shall be large enough to handle the asbestos workers during peak manpower periods. The facility shall meet the requirements for a hygiene facility specified by OSHA 29 CFR 1926.1101, DOE and site radiological control requirements. It shall be constructed using fire retardant material. When exiting a radiological contaminated area, whole body monitoring is required prior to showering.

The requirements of the hygiene facility compliance with radiological control requirements are as follows:

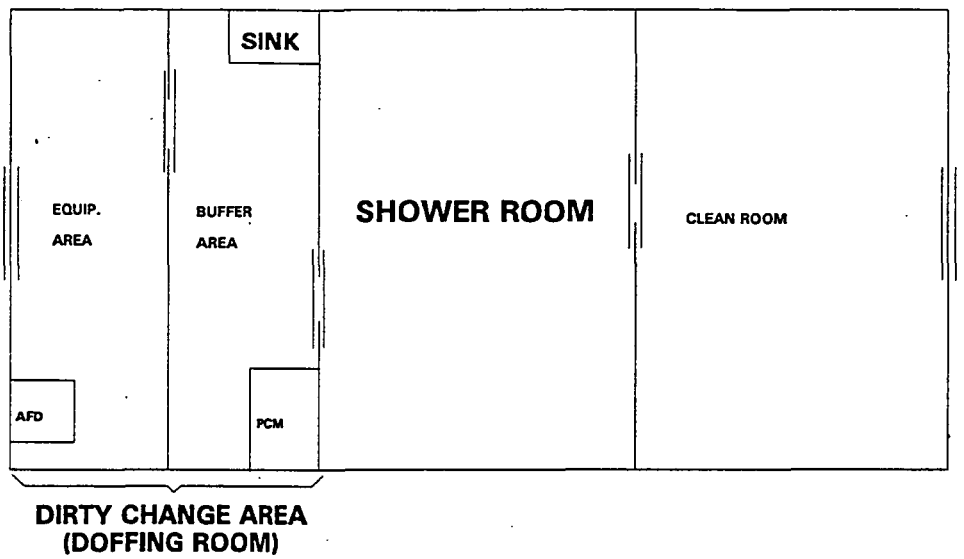
1. The asbestos hygiene facility shall be located adjacent to the radiological contamination area. The size of this facility is based on the number of employees that will be using the facility; this determines the number of showers required. The minimum number of showers required (based on number of workers) is located in 29 CFR 1910.141, Sanitation. It is recommended that the Contractor provide more showers than are legally required so the workers can exit the work area in a timely manner.

2. The doffing room shall be divided into two areas, the Equipment Area and the Buffer Area, and shall be maintained under negative pressure relative to the rest of the asbestos hygiene facility.

SECTION 01516

2203

FIGURE 1 ASBESTOS HYGIENE FACILITY (EXAMPLE)



3. The Equipment Area will be considered a radiological contaminated area. The air in the dirty change area shall be exhausted through a HEPA filtered air filtration device to assist in cleaning the air in the change area. The air change requirement in the dirty change area is 4 air changes per hour at a minimum of -0.02 inches of water pressure differential, relative to outside pressure. The dirty change area shall be large enough to accommodate four containers for segregation of asbestos contaminated waste and personal protective equipment, and an Air Filtering Device. The dirty change area shall have hooks or shelves for storage of hardhats and toolbelts.

4. A step-off pad will be established in the airlock/doorway separating the radiological contaminated area from the radiological controlled area creating a boundary for control of asbestos contaminated items and radiological contamination. The second area in the doffing room (Buffer Area) will be a radiologically controlled area which should be maintained free of any asbestos or radiological contamination. The Contractor shall ensure that an electrical outlet exists for the PCM. The minimum power requirements for the PCM are 120 volts AC and 1 amp. The PCM minimally requires an area of 5.5 feet by 4 feet by 8 feet in height. The buffer area shall also contain a sink for the rinsing of respirators prior to doffing.

5. Water shall be collected from the shower room and the buffer area sink, and be filtered down to 5 microns for asbestos fibers prior to discharge to the site wastewater treatment facility.

105

6. The clean room shall contain benches, lockers for storage of workers' personal clothing, and shelves for storage of personal protective equipment.

PART III EXECUTION

3.1 PREPARATION

A. Regulatory:

The Contractor shall:

1. Notify the Ohio Department of Health (ODOH) ten (10) days prior to start of ACM removal; coordinate with FDF prior to submitting ODOH notification (Note: FDF will be responsible for notifying the EPAs and all other applicable governmental agencies before start of work).

2. Comply with work practices and procedures set forth in all applicable Federal, State, and local codes, regulations, and standards.

3. Obtain certifications and licenses.

4. Take precautions to prevent creation of friable ACM during handling.

B. Work Area (for containment work):

1. Isolate the work area.
2. Establish hygiene facility/equipment room.
3. Install primary containment barriers.
4. Cover the floor with two layers of 6 mil polyethylene sheeting.
5. Size plastic to minimize seams.
6. Cover walls and any contained work area with 6 mil polyethylene sheeting.
7. Provide load out facility and emergency exits.
8. Post the required asbestos hazard warning signs.

C. Work Area (for glove-bag/wrap and cut removal):

1. Isolate work area.
2. Establish hygiene facility/equipment room.
3. Install work area barriers.
4. Cover the floor with one layer of 6 mil polyethylene sheeting.
5. Post the required asbestos hazard warning signs.

3.2 APPLICATION

A. Wet methods and engineering controls/containment shall be utilized throughout abatement activities to prevent employee exposure as well as the release of visible asbestos emissions to the

environment.

2203

B. Removal procedures:

1. Wet all ACM to be removed with amended water solution.

2. Saturated ACM shall be removed in manageable sections and maintained wet until placed into disposal containers or sealed in 2 layers of clear 6-mil plastic.

3. Material removed from building structures or components shall not be dropped or thrown to the floor or into disposal containers.

4. Large components removed intact may be wrapped in two layers of clear 6-mil polyethylene sheeting, secured with tape and properly labeled. All piping (less than 12 inches in diameter) insulated with ACM may be removed with ACM in place. Wrap the piping with two layers of clear 6-mil polyethylene sheeting. Remove ACM from area of cut utilizing glovebags as containment. Exposed ACM ends shall be capped and the pipe shall be wrapped in clear 6-mil polyethylene sheeting. Containerize according to the Waste Management Plan, located in Part 6 of the IFB/RFP.

5. Asbestos-containing material with sharp-edged components (e.g., nails, screws, metal lath, tin sheeting) which will tear the polyethylene bags and sheeting shall be placed into Contractor-supplied, properly labeled containers, and subsequently bagged for disposal.

6. After completion of all stripping work, surfaces from which ACM has been removed shall be wet-brushed and sponged or cleaned by some equivalent method to remove all visible ACM residue.

C. Cleanup procedures:

1. Remove and containerize all visible accumulations of ACM and asbestos-contaminated material.

2. Wet clean all surfaces in the work area.

3. For containment work, after cleaning the work area, wait at least 24 hours to allow fibers to settle, and HEPA vacuum and wet clean objects and surfaces in the work area again.

4. Inspect the work area for visible residue.

5. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by FDF.

6. Apply lockdown to all surfaces in the work area.

7. For containment work, aggressive clearance testing shall be performed by FDF and the

acceptable limit <0.01 f/cc by Phase Contrast Microscopy.

8. Upon successful completion of aggressive clearance testing by FDF, the Contractor shall remove containment and dispose of it as ACM waste per Part 6 of the IFB/RFP.

9. Wastewater associated with asbestos abatement shall be handled in accordance with Article 3.1.D of Section 01517 of this specification package.

D. Floor tile, mastic, woven cloth-covered electric wire, and gaskets may become friable during removal; therefore, the Contractor shall remove such material in a manner that does not allow it to become friable while also adhering to all applicable government, state, and local asbestos abatement regulations.

END OF SECTION

SECTION 01517 2203

REMOVING/FIXING RADIOLOGICAL CONTAMINATION

PART I GENERAL

1.1 SCOPE

A. Decontamination of dismantled equipment or the structure to a level that permits removal of the debris from a local containment or enclosure, or permits opening the building to the environment. This section includes, but is not limited to:

1. Decontaminating low-level uranium and thorium contaminated equipment, materials, structural members, and/or buildings.

2. Decontaminating enriched uranium contaminated equipment and materials.

3. Decontaminating RCRA contaminated equipment and materials.

4. Controlling and moving effluent produced during the removal and/or fixing of contamination.

5. Fixing contamination.

B. Project Conditions

1. Process material (i.e., green salt, yellow cake, black oxide) has been removed from process equipment to the maximum extent practical by FDF prior to D&D activities. If process material is found during D&D activities, FDF shall be notified prior to disturbing the condition.

2. See Specification Section 01120, Article 3.1.B, for requirements to establish an inspection area.

3. Removing/fixing radiological contamination on multiple layers of transite roof panels is addressed in Article 3.1.C of this Specification Section; handling of transite panels is addressed in Specification Section 07415.

4. Building 79 is classified as a Hazardous Waste Management Unit (HWMU) and shall be decontaminated pursuant to the specific conditions included in Part 6 of the IFB/RFP.

C. FDF will perform all effluent sampling and analysis.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.
B. Section 03315 - Concrete/Masonry Removal
C. Section 05126 - Structural Steel Dismantlement.
D. Section 07415 - Transite Removal.
E. Section 15065 - Equipment/System Dismantlement.
F. Section 15067 - Ventilation and Containment.

109

SECTION 01517

1.3 REFERENCE MATERIALS

See Part 7 of the IFB/RFP Package for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Safe Work Plan Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1.	DOE Order 5400.5	Radiation Protection of the Public and the Environment.
2.	DOE/EH-0256T	Radiological Control Manual, April 1994.
3.	DOE/EM-0142P	Decommissioning Handbook, Chapter. 9, Mar. 1994.

B. 10CFR835 Occupation Radiation Protection

1.5 SUBMITTALS

A. Before start of decontamination work, the Contractor shall submit for approval a Safe Work Plan in accordance with IFB/RFP, Part 7, Contractor Safe Work Plan Format Requirements, describing the system design for removing and/or fixing contamination, including the methods and equipment for: removing contamination; fixing contamination; and controlling, filtering, and transporting effluent produced during removal and/or fixing activities.

B. Product Data: The Contractor shall submit manufacturer's technical information including the material to be used, its intended use, and its application instructions.

1.6 DELIVERY, STORAGE, AND HANDLING

The Contractor shall deliver materials in original, new and unopened containers bearing the manufacturer's name, label, and the following information:

A. Name or title of material.
B. Manufacturer's stock number and date of manufacture.
C. Manufacturer's Name.
D. Application instructions.
E. Material Safety Data Sheets.

110

SECTION 01517

2203

PART II PRODUCTS

2.1 CONTRACTOR'S EQUIPMENT

A. The Contractor shall supply all equipment required to remove and/or fix contamination.

B. The Contractor shall supply all equipment required to control, filter, and move effluent produced during removal and/or encapsulation of contaminants.

1. The filter system shall consist of a 20 micron pre-filter and a 5 micron filter to remove entrained particulate prior to effluent discharge to tankage.

2. The Contractor shall construct all holding tank systems and secondary containment systems as specified in Article 3.1.D and 3.1.E of this specification.

2.2 MATERIALS

A. Encapsulating coatings: If encapsulating coatings are employed, they shall be Carboline D3358 or approved equal. Manufacturers may include, but are not limited to: Tnemec Series 6 - Tnemec-Cryl, and products by Sherwin-Williams and International Protective Coatings.

B. If non-strippable coatings are employed, they shall include Polymeric Barrier System (Bartlett), or an FDF-approved equal.

C. Plastic sheeting: Where encapsulation by clear plastic sheet wrapping is allowed, the wrapping shall be a minimum of 6-mil reinforced polyethylene sheeting.

PART III EXECUTION

3.1 APPLICATION

A. Requirements for managing non-process debris, process debris, and suspect process debris are described in Specification Section 01120, Articles 3.2.A.1, 3.2.A.2, and 3.2.A.3, respectively.

B. Requirements specific to debris decontamination and their removal from a building enclosure or local containment:

1. Prior to removing debris from a building enclosure or local containment, all external surfaces shall be free of gross removable surface contamination and all openings of equipment and debris that are potentially contaminated internally with removable contamination shall be sealed. For large items such as ductwork, the Contractor may encapsulate all internal surfaces in lieu of sealing. Acceptable methods for removing surface contamination include, but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, or other methods approved by FDF.

111

2. Debris and equipment/systems shall be managed in accordance with Specification Section 01120, Article 3.2.

3. Thorium-contaminated items cannot be released from the building enclosure or local containment areas unless surveyed for thorium-specific release limits (as referenced in Part 8 of the IFB/RFP). Items taken from these areas shall be either decontaminated, wrapped and brought directly to containers labeled as containing thorium-contaminated items (not for re-packaging), or containerized prior to removal from the enclosure as determined by the Contractor.

4. Equipment/systems identified by FDF as being contaminated with uranium with an enrichment over 2 percent will be removed, wrapped, and containerized by the Contractor for disposition as contaminated material without decontamination. These items shall not be allowed to get wet.

C. Requirements Specific to Decontamination of Structures and Outdoor Process Tanks/Pipes:

1. Structures:

Prior to opening the structures that require decontamination, as specified in the Pay Item Schedule of Part 6 of the IFB/RFP, to the environment by removing the exterior siding or structural dismantlement, the Contractor shall remove and/or fix radiological contamination on all surfaces within the facility until the detected radioactivity levels are below the criteria as defined in Part 8 of the IFB/RFP. FDF will perform a radiological release survey to ensure the radioactivity criteria are met.

2. Transite Roof Panels:

Exterior panels shall be removed in a manner that minimizes the possibility of loose contamination becoming airborne (visible) when the panel is removed. A HEPA vacuum shall be used to remove any loose contamination which may be exposed when the exterior panel is removed (e.g., the under side of the outer panel and the upper surface of the lower roof panel). After the roof panels have been vacuumed, the newly exposed surfaces shall be encapsulated to fix any contamination which remains. Vacuumed residues shall be handled as in accordance with the Waste Management Plan (Debris Category J).

3. Outdoor Process Tanks and Pipe:

a. Prior to demolition of outdoor process (or suspect process) tanks, surfaces (interior and exterior) shall be decontaminated to meet the radiological release levels for outdoor process tanks contained in Part 8 of the IFB/RFP. If outdoor tanks do not meet the contamination limits in Part 8 of the IFB/RFP, they shall be demolished within a containment, either constructed or existing, in accordance with Specification Section 15067 unless one of the following methods are implemented:

112

1. Encapsulate and mechanically cut (e.g., shear, saw, etc.):

   Prior to tank demolition, the interior of the tank shall be empty and fully encapsulated. During tank demolition, the work area shall be misted with water to minimize release of airborne contamination.

2. Torch or other "hot cutting" methods:

   The Contractor shall propose methods that minimize "hot cutting" (e.g., oxy/gas and oxy/acetylene torch cutting). If approved by FDF, "hot cutting" of surfaces that exceed 25,000 dpm/100cm^2 beta-gamma total contamination shall be performed within containment per Section 15067. Hot cutting of tank surfaces may be considered by FDF as a proposed method of dismantlement for tanks and pipe located outside of containment provided HEPA filtered ventilation is maintained and/or point-of-cut ventilation can be provided such that fugitive emissions are captured and project boundary airborne radioactivity levels are maintained according to limits specified in Part 8. The ventilation/containment requirements of Section 15067 apply.

3. Hot cutting may be performed on contaminated surfaces less than 25,000 dpm/100cm^2 beta-gamma total contamination with local HEPA ventilation.

b. Only exterior decontamination applies to process pipe, per Article 3.1.B.1; interior decontamination is not applicable. Internal surfaces of process piping are assumed to exceed both the removable and total contamination limits for uncontained demolition. However, demolition of process piping that is located outside of the building structures may be performed outside of containment if the methods of cutting inherently minimize fugitive emissions. Process piping must be sealed immediately after cutting.

4. Acceptable methods for removing surface contamination on structures and outdoor tanks/pipes include, but are not limited to: hydro-blasting with a minimum of 1,000 psi, steam-cleaning, sponge blasting, CO_2 blasting, or other FDF-approved method.

5. Encapsulation of contaminants is required if contamination levels specified in Part 8 of the IFB/RFP have not been met and decontamination has been attempted at least once. FDF shall be notified prior to encapsulation to allow for inspection for visible process residues. Acceptable methods for encapsulating contamination, which is not readily removed by the above-identified methods include, but are not limited to, encapsulating coatings, non-strippable coatings as referenced in Article 2.2, and wrapping in reinforced sheeting and sealed prior to movement to prevent migration of potential contaminants. The Contractor shall take precautions to prevent the breaching of encapsulating coatings applied to equipment or structure. If an encapsulating coating is breached after application, during activities leading up to but not including structural demolition, the Contractor must take action to reseal the breached areas.

6. If stabilizer or non-strippable coatings are used as fixatives, they will meet the requirements of this specification (see Article 2.2).

7. Down posting of thorium contaminated areas requires that contamination levels meet the thorium-specific release limits of Specification Section 01519.

8. If hydro-blasting or steam cleaning is employed, the Contractor shall:

   a. Seal floor cracks/seams, openings, and building cracks using sealants to protect the environment from migration of contaminants.

   b. Contain effluents to the building interior/outdoor tank containment system and subsequently to collection systems.

9. The Contractor may utilize any existing building floor sumps for effluent collection, as long as system capacity for sludge and/or liquid does not exceed limitations determined from enriched levels as stated in Article 3.1.D.

10. The Contractor shall take precautions to prevent the spread of contamination from other more-contaminated areas of the facility to less contaminated areas.

11. Acceptable methods for decontamination of Hazardous Waste management Units (HWMUs) to meet RCRA/CERCLA closure Ohio Environmental Protection Agency guidance are hydro-blasting or steam cleaning with a minimum of 1,000 psi, unless otherwise stated in Part 6 of the IFB/RFP for that particular component.

D. Rinseate/Effluent Handling:

1. The Contractor shall collect all waste and effluent generated while removing and/or fixing contamination. Effluent and sludge shall be containerized in accordance with the requirements listed in Articles 3.1.D and 3.1.E of this Specification Section.

2. For rinseate/effluent generated from decontamination of a structure containing uranium and/or thorium contamination or from decontamination washwater generated from contact with outdoor pads with process tanks and pipes, the Contractor shall supply all effluent collection equipment (e.g., pumps, secondary containment) except tanks, which will be supplied by FDF. Effluent tanks require secondary containment with a minimum of 10 percent of the combined capacity of the effluent tanks housed and not less than the volume of one full tank, whichever is greater.

3. Enriched Equipment/Material (if listed in Part 6 of the IFB/RFP): In addition to effluent tanks, the washing of enriched equipment/material requires the use of smaller tanks to permit safe quantities to be maintained (for nuclear criticality safety purposes). There are no mass restrictions for rinseates or sludges with a U-235 enrichment less than 1 percent.

   a. For enrichments greater than 1 percent and less than or equal to 1.25 percent, the Contractor shall supply effluent storage tanks of no greater than 175 gallon capacity, in numbers sufficient to permit 15 calendar days storage without impact to Contractor operations.

b. For enrichments greater than 1.25 percent and less than or equal to 2 percent (no equipment/material over 2 percent enrichment is to be decontaminated, see Article 3.1.B.3), the Contractor shall supply effluent storage tanks no greater than 30 gallon capacity, in numbers sufficient to permit 15 calendar days storage without impact to Contractor operations.

c. The Contractor shall store sludge, resulting from enriched equipment/material cleaning, in 55-gallon drums. Filled drums may be stored no closer than 2 feet apart.

d. Inspection of Plant 6 equipment revealed that all equipment appears to have uranium enrichment levels of less than 1 percent. Should equipment be discovered with uranium enrichment greater than 1 percent then equipment/material washing operations and effluents shall be maintained separate, based on enrichment and type, by the following: 1) uranium less than or equal to 1 percent enrichment; 2) uranium greater to 1 percent enrichment but less than or equal to 1.25 percent enrichment; 3) uranium greater than 1.25 percent enrichment but less than or equal to 2 percent enrichment; and 4) thorium. Wash systems can be maintained separate by campaign or by physically separate systems.

4. Approval to commingle the effluents and sludges is required from FDF. Approval to transfer effluents to large effluent tanks is required from FDF.

5. Upon approval from FDF, the Contractor shall empty the contents of the effluent storage tanks and transport the effluent to the FEMP Advanced Wastewater Treatment Facility.

6. Effluent generated from the decontamination and/or rinsing of HWMUs shall be collected and temporarily stored separately from general, non-HWMU effluent. FDF will notify the Contractor when commingling of HWMU and non-HWMU effluent may occur.

E. Sludge Drumming

Sludge limits for individual drums from enriched cleaning operations are restricted to 104 grams of U-235 per 55-gallon drum. (Note: The weight is limited due to Department of Transportation and/or the maximum allowable weight of the drum.)

END OF SECTION

115

SECTION 01519

DECONTAMINATION OF CONTRACTOR PROVIDED TOOLS, EQUIPMENT, AND MATERIAL

PART I GENERAL

1.1 SCOPE

A. Preventative measures for and decontamination of Contractor provided tools, equipment (including vehicles), and material to a level that permits removal from an enclosure/work zone, restricted reuse, or unrestricted release. This Section includes, but is not limited to:

1. Preventative measures/waste minimization.
2. Decontamination area requirements.
3. Methods of decontamination activities.
4. Control of effluent and waste management activities.
5. Relocation, reuse, and release activities for tools, equipment, and material.

B. Project Conditions and Requirements:

1. All facilities, unless expressly noted in Part 6 of the IFB/RFP, shall be considered contaminated with radioactive material.

2. All items are considered potentially contaminated if they have been used or stored in Controlled Areas that could contain unconfined radioactive material.

3. The Contractor shall establish a holding/inspection area to allow Fluor Daniel Fernald (FDF) to perform tool and equipment radiological surveying.

   a. The holding/inspection area shall be arranged such that routine access is prevented by means of fencing and/or barrier tape with appropriate posting to identify that the items contained are being held for survey, and such that the area is off limits to individuals other than FDF/Contractor radiological survey personnel.

   b. Only those items which meet the requirements (as described in this Specification Section) for leaving the work zone should enter the inspection area.

4. The Contractor should assume that extensive dismantlement and an aggressive decontamination effort will be required to achieve unrestricted release of items that have come in contact with radioactive material or were used in contamination areas. Based on past experience using the best available technologies, decontamination and survey access requirements to meet the release criteria may be difficult to achieve.

5. Hand and portable tools used in controlled areas for performance of the subcontract are to be considered expendable as specified in Part 4 IFB/RFP, Special Terms and Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED (SC-11).

SECTION 01519

2203

1.2 RELATED SECTIONS

Work related to this Specification Section shall also be accomplished in accordance with the following Specification Sections:

A. Section 01120 - Debris/Waste Handling Criteria.
B. Section 01517 - Removing/Fixing Radiological Contamination.
C. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. Part 4 of IFB/RFP, Special Terms and Conditions, DISPOSITION OF CONTAMINATED TOOLS, EQUIPMENT, AND MATERIALS (SC-11).

B. Part 6 of IFB/RFP, Scope of Work

C. Part 7 of IFB/RFP, Safe Work Plan Requirements

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1. DOE Order 5400.5, Radiation Protection of the Public and the Environment.
2. DOE/EH-0256T, Radiological Control Manual, April 1994.
3. DOE/EM-0142P, Decommissioning Handbook, Chapter. 9, Mar. 1994.

B. 10CFR835 Occupation Radiation Protection

1.5 SUBMITTALS

A. The Contractor must provide FDF with a list of all tools, vehicles, equipment and material to be brought onsite which have been used in conjunction with radioactivity in the past including such information as:

1. Previous use of the equipment.
2. Dates of use.
3. Levels of contamination.
4. Radioisotopes involved.

This list must be submitted as soon as known but no less than 30 days in advance of bringing the item onsite. FDF reserves the right to reject the Contractor's request to bring these items on site. Any tools or equipment contaminated with a radioactive material greater than 1 percent enriched

117

uranium or thorium-232 will be rejected. Thorium contaminated tools and equipment may only be used in a thorium contaminated area.

B. The Contractor shall submit the manufacturer's technical information for any decontamination or contamination controlling agents for compliance review prior to use. This information shall include:

1. Material to be used.
2. Intended use.
3. Application instructions.
4. MSDS Sheets.

C. Before start of decontamination work, the Contractor shall submit a Safe Work Plan addressing tool and equipment decontamination for compliance review in accordance with Part 7 IFB/RFP, Contractor Safe Work Plan Format Requirements, describing the following:

1. Preventative measures to be employed.
2. The design and construction of the decontamination area.
3. The methods to be utilized for decontamination (see Article 3.1.C of this Section).
4. The methods and equipment for controlling and handling effluent and/or secondary waste produced during decontamination activities.
5. Plans for relocating, reusing, or releasing tools and equipment.

PART II PRODUCTS

2.1 CONTRACTOR PROVIDED TOOLS AND EQUIPMENT

A. The Contractor shall furnish all equipment, tools, and material required to perform the work described in the subcontract except where the contract explicitly states FDF will provide the item.

1. The Contractor shall deliver approved decontamination and contamination control materials in original, new and unopened containers bearing the manufacturer's label, and the following information:

a. Name or title of material.
b. Manufacturer's stock number and date of manufacture.
c. Manufacturer's Name.
d. MSDS Sheets.

2. All possible shipping and packing materials will be removed upon receipt at the site prior to entering the controlled area to minimize contaminated waste generation.

B. For the purposes of meeting the "As Low As Reasonably Achievable" (ALARA) goal for tools, equipment, and materials, it is expected that all reasonable efforts are to be used to control residual contamination to the extent that there is no detectable contamination on items that were free of

contamination prior to use, or there is no increase in the level of contamination on items that were previously contaminated. The ALARA efforts include, but are not limited to, the following:

1. Protective measures prior to use of items.
2. Preventative measures while items are being used.
3. Decontamination upon completion of work activities.

C. In support of the ALARA initiative, all Contractor furnished tools, vehicles, equipment, and material may be inspected for radioactive contamination by FDF personnel prior to initial entry and upon removal from the radiological controlled area.

PART III EXECUTION

3.1 APPLICATION

A. Prevention of or Minimizing Contamination:

1. The Contractor shall plan and coordinate all work to minimize exposure of equipment, tools, and vehicles to potential radioactive contamination. Equipment shall be located in the area with the least potential for contamination. For example, locate equipment outside the facility with leads, hose lines, etc. wrapped and run to the interior of the facility. Typical examples of equipment where this approach should be used include air compressors, high pressure hydroblasters, welders, generators, oxy-acetylene cylinders, and battery chargers.

2. It is the Contractor's responsibility to evaluate materials, tools and equipment for ease of decontamination and disassembly that may be required for decontamination prior to use on-site. Use of unrestricted release items (i.e., those other than expendable as defined in Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED) should incorporate appropriate precautions to prevent contamination which should be implemented prior to and during use. Examples of precautionary measures may include the following which are expected to be implemented as described in the Safe Work Plan:

   a. Internal combustion equipment subject to contamination should make use of pre-filters or have a separate source of outside air on the intake.

   b. High volume air handling equipment such as blowers, compressors, etc., shall have a filtered inlet to minimize the potential for internal contamination due to build up of low level radioactivity.

   c. The Contractor is prohibited from bringing electrical driven mobile equipment to the FEMP (e.g., fork-lifts) except where only electric driven equipment is available.

d. Protective sheathing/covers, strippable coatings, or protective caps should be used to minimize the potential for contamination (e.g., coating the buckets of man lifts or other walking/standing surfaces). In addition, all openings on equipment, tools, or vehicles that may permit contamination of inaccessible or difficult to clean areas shall be covered and protected.

3. If encapsulants, sealants and/or coatings are utilized during the project, the Contractor shall be responsible for protecting their tools and equipment from over spray. In addition, the Contractor shall ensure that the encapsulant, sealant and/or coating can be readily removed during decontamination activities, if necessary.

B. Decontamination Area Requirements:

1. Tools and equipment utilized inside an enclosure/building may be decontaminated at an existing indoor debris cleaning location.

2. The following are examples of options for establishing outdoor decontamination areas:

a. Utilize an existing concrete pad with run-on and run-off controls.

b. Construct a temporary containment area. Containment must have a bermed perimeter to ensure run-off control. An example of acceptable containment is Herculite with sandbag underlayment perimeters on grade without penetrations. Containment used must be adequate to maintain its integrity.

C. Methods of Decontamination Activities:

1. Where decontamination is needed, the Contractor shall at a minimum use the following as applicable:

a. Dry cleaning.

b. Steam cleaning.

c. High pressure, hot water hydroblasting (may be used in conjunction with abrasive techniques and approved decontamination agents) with a minimum of 1,000 psi and HEPA vacuuming.

2. When selecting a decontamination technique other than those identified in C.1 above, consideration should be given to those technologies which minimize radiological airborne emissions, secondary wastes, and tool or equipment damage.

3. As an alternative to decontamination, replacement of contaminated components shall be in accordance with the requirements of Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS, THAT HAVE BECOME CONTAMINATED (SC-11).

a. The contaminated components are subject to the cleaning criteria stated in Article 3.2.B of this Specification Section.

b. The contaminated components will be managed and handled per Specification Section 01120 and Part 6 of the IFB/RFP subsequent to the cleaning as directed by FDF.

D. Control of Effluent and Waste Management Activities:

1. The Contractor shall control and collect all waste and effluent generated while removing and/or fixing contamination in accordance with the requirements listed in Part 7 IFB/RFP, and Specification Sections 01517 and 01120.

2. Management of wastes generated during decontamination activities shall be in accordance with Specification Section 01120 and the Waste Management Plan located in Part 6 of the IFB/RFP.

E. Relocation, Reuse, and Release of Tools, Equipment, and Material:

1. The Contractor shall perform all decontamination and surveying activities required to verify that the surface contamination limits identified in Table 1 of this section are not exceeded. FDF shall perform final verification surveying.

2. The Contractor shall provide a minimum of 24 hours prior notice to FDF of intent to remove tools and equipment from the work area.

3. Release of tools, equipment, and material from Contamination Areas to the Controlled Area:

a. If removable contamination in excess of the limits of Table 1 is present on the tools, equipment or material, then the items must remain in the contamination area for decontamination or the item must be contained such that no contaminated surfaces of the item are accessible without disassembling the equipment or breaching the containment.

b. Examples of acceptable containment include plastic wrapping, yellow Herculite wrapping, or a sealable hard container. However, the containment used must be adequate to maintain its integrity considering the weather, conditions of storage, and the methods or conditions of transport.

c. If the removable contamination limits are met but the total (fixed plus removable) limit is exceeded, the item may be labeled or identified as radioactive material by FDF and released to the Controlled Area.

4. Unrestricted Release Criteria:

Tools and equipment with detectable radioactivity may be released from the controlled area with the approval of a FDF Material Release Evaluator if all of the following have been met:

a. Both removable and total surface contamination (including contamination on and under any coating) are in compliance with the levels given in Table 1 and that the item has been subjected to the ALARA process described in Article 2.1.B of this Specification Section.

b. All areas must be readily accessible for survey for residual radioactivity including proper surface counting geometry to allow for accurate quantification. Items with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release. The item must either be disassembled to permit an adequate survey to certify that internal contamination is at or below the limits of Table 1, or well documented process knowledge can be applied to provide confidence that contamination in inaccessible areas is not probable. In evaluating the potential for contamination in inaccessible areas, consideration will be given to where the item was used on site and preventative measures taken prior to use, such as coverings, wrappings, air intake filters, etc.

c. Upon approval from FDF, the Contractor shall remove the tools, equipment, and/or materials off-site within eight hours.

5. Release to an Off-Site Licensed Facility:

a. If the Contractor possesses the appropriate license to receive, possess, use, and transfer the equipment, tools, material, or vehicles with radioactive contamination, Contractor may elect to remove such items from the site in lieu of decontamination. The responsibility of complying with all state, local and federal regulations during the packaging, shipping, and receipt of the equipment shall be the responsibility of the Contractor. The Contractor shall submit a copy of the license and applicable procedures to FDF for compliance review prior to removal of the contaminated equipment. A copy of all Bills of Lading shall be submitted to Fluor Daniel Fernald prior to shipment.

b. The Contractor is to provide 24 hours notice to FDF prior to shipping radioactive tools, equipment, and/or material.

3.2 UNSUCCESSFUL/IMPRACTICAL CONTRACTOR DECONTAMINATION

A. If FDF determines that the contractor has implemented the requirements of this Section and the Safe Work Plan and the Contractor's decontamination efforts are unsuccessful or decontamination is not practical (as identified below), refer to Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS THAT HAVE BECOME CONTAMINATED (SC-11) for action to be taken.

B. Decontamination may be considered impractical for non-expendable items that are integral parts of equipment and not readily replaceable such as porus materials (e.g. wood and fiberglass), wire rope, chains, brushes, items with finned surfaces, and similar items where contamination may be embedded within the material configuration matrix. These items may not be released if detectable contamination is identified on the surface.

C. All tools, material, vehicles equipment accepted by FDF for disposition must have been cleaned to meet the visual inspection requirements defined in Specification Section 01517 and handled as defined in Specification Section 01120 and the Waste Management Plan located in Part 6 of the IFB/RFP.

3.3 QUALITY ASSURANCE

All QA requirements required to be met by the Subcontractor are stated in Part 9 of the IFB/RFP.

3.4 QUALITY CONTROL

The Contractor shall perform or witness inspections and tests of procured material, equipment and items, work in progress and completed items within the bounds of the contract.

SECTION 01519

TABLE 1 SURFACE CONTAMINATION LIMITS[a]

NUCLIDE[f]	FIXED PLUS REMOVABLE		REMOVABLE[b],[e]
	AVERAGE[b],[c]	MAXIMUM[b],[d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

(a) Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

(b) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

(d) The maximum contamination level applies to an area of not more than 100 cm^2.

(e) The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

(f) The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 may be adjusted on a case by case basis. Consult with Radiological Compliance when required to apply these limits for unrestricted release.

END OF SECTION

SECTION 03315

CONCRETE/MASONRY REMOVAL

2203

PART I GENERAL

1.1 SCOPE

Dismantling of all above-grade concrete and masonry, including:

A. Elevated floor and roof slabs.
B. Cast-in-place walls.
C. Precast concrete components.
D. Foundations, piers, and selected curbs.
E. Concrete encasement (e.g., fireproofing).
F. Interior and exterior masonry.
G. Control of fugitive emissions.
H. Windows, doors, roof louvers and lead.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01515 - Mobilization, Demobilization, and General Site Requirements.

C. Section 01517 - Removing/Fixing Radiological Contamination.

D. Section 05126 - Structural Steel Dismantlement.

E. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

See the Invitation for Bid/Request for Proposal (IFB/RFP) Package for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. American National Standards Institute (ANSI):

125

1. ANSI A10.6-90 Safety Requirements for Demolition Operations.

2. ANSI A10.8-88 Construction and Demolition Operations - Scaffolding - Safety Requirements.

3. ANSI A10.9-83 Construction and Demolition Operations - Concrete and Masonry Work - Safety Requirements.

B. National Fire Protection Association (NFPA):

1. NFPA 101A-98 Code for Safety to Life from Fire in Buildings and Structures.

2. NFPA 241-93 Standard for Safeguarding Construction, Alteration, and Demolition Operations.

C. DOE N441.1 Radiation Protection of the Public and the Environment.

D. 10 CFR 835 Occupational Radiation Protection.

D. Ohio Administrative Code (OAC): 3745-17-08 Restriction of Emission of Fugitive Dust.

1.5 SUBMITTALS

The Contractor shall submit for approval a Concrete/Masonry Removal Safe Work Plan in accordance with Part 7 of the IFB/RFP, Contractor Safe Work Plan Format Requirements, which contains the following information:

A. Detailed method and sequence of dismantlement, including equipment to be used.

B. Methods for control of contaminants, including control of fugitive emissions.

C. Materials, such as non-woven geotextile fabrics and surfactants, to be used.

D. Methods of cutting, including equipment to be used.

E. Calculations to verify structural adequacy of partially dismantled structure, as applicable, which shall be stamped by a Professional Engineer registered in the State of Ohio.

F. If dismantlement method requires personnel on the roof, the Contractor shall provide calculations verifying the structural adequacy of the roof to support personnel and equipment. These calculations shall be stamped by a Professional Engineer registered in the State of Ohio.

G. If controlled explosive methods are proposed to be used on building structures that are constructed of precast columns and roof beams, a detailed Safe Work Plan containing the following information shall be prepared and contain the following information:

1. Methods and materials to be used.

2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.

3. Methods and materials to control fugitive emissions.

4. Contingency plan for detonation failure.

5. Proof of permit, issued by the Bureau of Alcohol, Tobacco and Firearms, to use explosives.

6. Methods and materials to store explosives according to the requirements of 29 CFR 55 Subpart K.

7. Evidence of previous work experience using controlled explosives to take down multi-story structures near other structures within the last 5 years. Provide project locations and contacts for verification.

PART II PRODUCTS

2.1 MATERIALS

A. Non-woven Geotextile Fabric:

1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
2. Mirafi 160N by Mirafi, Inc.
3. ADS 600 by Advanced Drainage Systems, Inc.
4. Equal products manufactured by others will be acceptable.

B. Surfactants:

1. CP-225 CHIL-SORB by Childers.
2. FDF approved equal.

C. Encapsulants/Sealants:

1. CP-240 CHIL-LOCK by Childers
2. Certane 2050 by Certified Technologies.
3. Eppco #1 by Expert Environmental Products.
4. Serpiloc by International Protection Coatings Corp.
5. FDF approved equal.

SECTION 03315

PART III EXECUTION

3.1 PREPARATION

A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.

B. The Contractor shall take the following precautions to control fugitive emissions. A wet dust suppression system shall be used. This system will utilize the following:

1. Amended water (with surfactant).
2. Finely atomized water spray.

C. Concrete and masonry shall have contamination fixed or removed prior to dismantlement and, if applicable, prior to removing local containment or building enclosure, in accordance with Section 01517 of this specification package.

3.2 APPLICATION

A. The Contractor shall prevent damage to adjacent structures, materials, and equipment including underground utilities, during dismantlement activities. Activities to fell concrete structures outside their own footprint require prior approval. Activities to fell concrete structures shall maintain the integrity of porous surfaces to the extent practical to minimize dispersal of debris. If concrete dust is generated as a result of removal operations (due to crumbling, etc.), dust suppression techniques must be employed during demolition and, if necessary, during transportation.

B. Removal of Above-Grade Concrete/Masonry:

Any above-grade concrete/masonry remaining intact following structural dismantlement shall be removed down to grade-level except for poured concrete structures that are imbedded in soil (e.g., raised slabs, curbs on slabs, foundations, concrete tank saddles), which shall remain in place.

C. Removal of At-Grade Concrete/Masonry:

1. Concrete slabs, pedestals, columns, miscellaneous foundation piers, walls, and curbs shall be sealed and may remain intact during and after structural dismantlement.

2. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designated on the Civil Demolition Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab. Fill in damaged areas of base slab with patching grout as described in Specification Section 01515.

D. Cutting:

1. All material shall be reduced in size as required for containerization in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

2. Embedded steel reinforcing is considered part of concrete. Reinforcing bar/mesh shall be cut to less than 1 ft. from concrete mass.

3. Because of contamination levels, some concrete may require local containment for cutting activities in accordance with Section 15067 of this specification package. Any currently known areas requiring local containment are identified in Part 6 of the IFB/RFP; however, new or additional areas may be identified during dismantlement activities.

E. Explosives:

1. Interior non-load bearing masonry walls shall be removed using non-explosive methods prior to opening the shell of the structure. For interior poured concrete walls, the Contractor shall have the option to leave them in place during structural dismantlement provided that facility release criteria are met prior to structural dismantlement and the method of dismantlement in the Concrete/Masonry Removal Safe Work Plan is approved by FDF.

2. Any bituminous roofs felled through the use of explosives are to be dropped in a single unit and impact the ground in a horizontal plane.

3.3 SPECIAL INSTRUCTIONS

The following special instructions apply to concrete/masonry removal:

A. Doors, Windows, and Frames

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.

2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

B. Lead Materials

1. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

2. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut (i.e., 4 inches on each side of cut).

3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

SECTION 03315

C. Wall and Roof Louvers

The Contractor shall remove louvers and roof vents during exterior concrete/masonry removal and placed in appropriate containers.

END OF SECTION

SECTION 05125

2203

NEW STRUCTURAL STEEL/METALS

PART I GENERAL

1.1 SCOPE

Design, fabrication, and installation of miscellaneous metal items for protective barriers, lifting assemblies, rigging, and temporary bracing and supports.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 05126 - Structural Steel Dismantlement.

1.3 REFERENCE MATERIALS

See the Invitation for Bid/Request for Proposal (IFB/RFP) for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.

1.4 REFERENCES, CODES, AND STANDARDS

A. American Society for Testing and Materials (ASTM):

1. ASTM A36-94 Standard Specification for Carbon Structural Steel.

2. ASTM A307-94 Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

3. ASTM A325-94 Standard Specification for Bolts, Structural Steel, Heat Treated, 120/105 KSL Minimum Tensile Strength.

B. American Welding Society (AWS):

1. ANSI/AWS A2.4-93 Standard Symbols for Welding, Brazing, and Nondestructive Examination.

2. ANSI/AWS D1.1-96 Structural Welding Code, Steel.

3. ANSI/AWS D1.2-90 Structural Welding Code, Aluminum.

4. ANSI/AWS D1.3-89 Structural Welding Code, Sheet Steel.

131

C. American Institute of Steel Construction (AISC):

1. AISC Manual of Steel Construction - Allowable Stress Design (ASD), 9th Edition.

2. AISC Manual of Steel Construction - Load and Resistance Factor Design (LRFD), 2nd Edition

D. American National Standards Institute (ANSI):

ANSI A10.13-89 Construction and Demolition Operations - Steel Erection - Safety Requirements.

1.5 SUBMITTALS

A. The Contractor shall submit the following for conformance review by Fluor Daniel Fernald (FDF):

1. Calculations: Indicate design method, assumptions, loads, member forces, allowable stresses, and connection designs.

2. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

3. Indicate welded connections using standard ANSI/AWS A2.4 welding symbols. Indicate net weld lengths. Submit copies of welder's certifications with shop drawings.

4. A plan for conducting and documenting field quality testing and inspection including test methods and reports required under Field Quality Assurance.

5. Provide Material Safety Data Sheets for primer and finish coatings to be applied to new structural steel, and for welding materials.

6. Contractor's AWS Welding Program for approval.

7. Mill Test Reports for structural steel

B. For additional submittal requirements see Part 6 of the Invitation for Bid/Request for Proposal (IFB/RFP).

SECTION 05125

2203

1.6 DELIVERY, STORAGE, AND HANDLING.

ASTM A325 high strength bolts shall be delivered to the site in the original labeled containers and once onsite shall not be transferred into unlabeled containers. The label information shall include the type of bolt, purchase order number, and the name of the supplier.

PART II PRODUCTS

2.1 MATERIALS

A. Steel sections and plates: ASTM A36.

B. Structural Fasteners: Bolts shall be hardened and meet ASTM A325; nuts shall be heavy hex type meeting ASTM A563, Grade C; and washers shall be hardened and meet ASTM F436, Grade 1.

C. Miscellaneous Fasteners: shall meet ASTM A307.

D. Expansion Anchors: Expansion bolts used for securing steel to concrete shall be one of the following:

1. "Parabolt" as manufactured by Molly Fastener Group of Emhard, Temple, PA 19560.

2. "Wedge Anchors" as manufactured by ITT Phillips Drill Division, Michigan City, IN 46360.

3. "Kwik Bolt" as manufactured by Hilti, Inc., Stamford, CT 06405.

4. FDF-approved equal.

E. Welding Materials: ANSI/AWS D1.1 - Structural Welding Code. Use E70XX electrodes.

F. Abide by requirements of Federal Fastener Act

G. Shop Primer: Short-oil alkyd that is VOC compliant.

2.2 FABRICATION

A. For delivery to site, fit and ship assembled in largest practical sections.

B. Supply components required for connecting and anchorage of fabricated structural assemblies.

C. All welding procedures, welder's certification, and visual acceptance criteria must be in accordance with ANSI/AWS D1.1, Chapter 5.

D. Clean surfaces of rust, scale, grease, and foreign matter prior to applying shop primer. Prepare surface in accordance with paint manufacturer's instructions.

E. Shop prime with one coat of short-oil alkyd primer per manufacturer's instruction for primer (dry film) coat thickness.

F. Do not prime surfaces in direct contact with concrete or within 3 inch of where field welding is be required.

G. All coatings shall be free of lead and chromium.

PART III EXECUTION

3.1 PREPARATION

Prior to fabrication, the Contractor shall verify field dimensions.

3.2 INSTALLATION - GENERAL

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for installation loads and provide temporary bracing to maintain true alignment until completion of installation.

C. Field weld components as indicated on the approved drawings. Field welding shall be in accordance with ANSI/AWS D1.1, Chapter 3.

D. Fasteners shall be tightened to manufacturer's specifications or applicable design requirements.

E. Field modifications to load bearing structures shall require prior approval from FDF.

F. After installation, prime field welds and abrasions. Any steel embedded in concrete is an exception.

G. All steel shall be fabricated and installed in accordance with the AISC Manual of Steel Construction.

H. After use, all steel shall be dismantled and cut for containerization in accordance with Section 01120 and Section 05126 of this specification package.

3.3 QUALITY ASSURANCE

A. Calculations and shop drawings must bear the stamp of a Professional Engineer registered in the State of Ohio..

SECTION 05125

2203

B. The Contractor shall inspect high-strength bolted connections for all shop-fabricated steel, and perform tests and prepare test reports in accordance with the AISC specifications. All test results shall be submitted to FDF.

C. The Contractor shall conduct tests and shall state in each test report whether test specimens comply with requirements, and shall specifically state any deviations. Deviations must be approved in writing by FDF.

D. Shop and Field Welding

1. The Contractor shall: inspect and test, during fabrication and installation of structural steel assemblies in accordance with ANSI/AWS Structural Welding Code and as follows:

   a. Conduct inspections and tests as required. Record types and locations of all defects found in the work. Record work required and performed to correct deficiencies. All test results to be submitted to FDF.

   b. Perform visual inspection of all welds per AWS D.1.1.

   c. All welds that fail shall be repaired per approved Contractor AWS Welding Program.

   d. Reworked areas shall be retested using the same method as used to find original indications.

2. Perform nondestructive tests of welds per AWS D.1.1. Full penetration welded connections on structural steel rigging frame utilized for critical lifts, as defined in the FEMP Hoisting and Rigging Manual, shall be 100 percent radiograph tested by an independent certified testing lab. Results shall be submitted to FDF for approval.

   a. All welds that fail testing shall be repaired per approved Contractor AWS Welding Program.

   b. Reworked areas shall be retested using the same method as used to find original indications.

E. Correction of Substandard Work:

The Contractor shall correct deficiencies in structural steel work which inspections and laboratory test reports have indicated to be not in compliance with requirements.

END OF SECTION

135

SECTION 05126

STRUCTURAL STEEL DISMANTLEMENT

PART I GENERAL

1.1 SCOPE

This Section includes dismantling and containerization of:

A. Structural steel.
B. Bar joists.
C. Floor plate/decking.
D. Grating.
E. Stairs, ladders, and handrail.
F. Metal siding and roofing, including doors, louvers, and windows.
G. All other miscellaneous steel.
H. Control of fugitive emissions.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01517 - Removing/Fixing Radiological Contamination.

C. Section 03315 - Concrete/Masonry Removal.

D. Section 07415 - Transite Removal.

1.3 REFERENCE MATERIALS

See the Invitation for Bid/Request for Proposal (IFB/RFP) Package for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. American National Standards Institute (ANSI):

1. ANSI A10.6-90 Safety Requirements for Demolition Operations.

2. ANSI A10.8-88 Construction and Demolition Operations - Scaffolding - Safety Requirements.

3. ANSI A10.13-89 Construction and Demolition Operations - Steel Erection.

B. National Fire Protection Association (NFPA):

NFPA 241-96 Standard for Safeguarding Construction, Alteration, and Demolition Operations.

C. United States Occupational Safety and Health Administration:

29 CFR 1926.858 Removal of Steel Construction

1.5 SUBMITTALS

The Contractor shall submit to Fluor Daniel Fernald (FDF) for conformance review a structural steel removal Safe Work Plan in accordance with IFB/RFP, Part 7, Contractor Safe Work Plan Format Requirements, that contains the following information:

A. Detailed sequence of dismantlement and method of cutting, including equipment to be used.

B. Methods for contaminant control, including fugitive emissions during cutting.

C. Detailed plan for protecting lay down and cutting areas from contamination by lead paint chips and for controlling airborne radiological emissions.

D. Methods and materials used for cutting lead-painted steel.

E. If structural steel is removed in sections, verify the structural adequacy of the remaining structure. Calculations and drawings to verify the structural integrity of the partially dismantled structure must bear the stamp of a Professional Engineer registered in the State of Ohio.

F. Plans for personnel tie offs, use of pick boards and walking on or near roof purlins/girders.

G. If controlled explosive methods are used for structural steel dismantlement, a detailed Safe Work Plan containing the following information shall be prepared:

1. Methods and materials to be used.

2. Means to protect adjacent structures, equipment, material, and underground utilities from damage, including protection from projectiles.

3. Methods and materials to control fugitive emissions.

4. Contingency plan for detonation failure and safe recovery of all undetonated charges.

5. Proof of permit, issued by the Bureau of Alcohol, Tobacco and Firearms, to use explosives.

6. Evidence of previous work experience using controlled explosives to take down multi-story structures within the last 5 years. This experience may be shown through the sub-tier contract. Provide project locations and contacts for verification.

7. If non-load bearing interior concrete/masonry walls are to be removed, refer to concrete/masonry removal specifications in Section 03315 of this specification package.

8. Identify locations of all cuts and charges and detonation sequence on composite drawings which will be provided by FDF.

9. Provision of adequate protection of charges to prevent shrapnel from damaging the non-electric detonation system or persons near the exclusion boundary.

10. Predications of rubble/debris piles should be made to ensure that safe exclusion zones are established.

PART II PRODUCTS

2.1 MATERIALS

A. Non-woven Geotextile Fabric:

1. Trevira Spunbond 1120 by Hoechst Celanese Corp.
2. Mirafi 160N by Mirafi Inc.
3. ADS 600 by Advanced Drainage Systems, Inc.
4. FDF-approved equal products.

B. Surfactants:

1. CP-225 CHIL-SORB by Childers.
2. FDF-approved equal products.

PART III EXECUTION

3.1 PREPARATION

A. The Contractor shall ensure that adequate lay down space has been cleared and barriers have been established.

B. Steel and siding shall have contamination removed or fixed prior to exposing steel and siding to the environment in accordance with Section 01517 of this specification package.

C. If controlled explosive methods are used, the Contractor shall take precautions to control fugitive emissions by saturating the explosion footprint with water 2 to 4 hours prior to the implosion.

3.2 APPLICATION

A. All dismantlement activities shall be performed in accordance with the standards listed in Article 1.4 of this Section.

B. The Contractor shall apply mechanical means of cutting and removing the structural steel to the largest extent possible while also avoiding damage to adjacent structures, components, equipment, and utilities.

C. The roof deck and roofing material, panels and concrete floor decking shall also be demolished with the structure wherever possible. Roofing material containing asbestos containing material (ACM) shall not be demolished with structural steel.

D. The Contractor shall dismantle, shear and segregate the structural steel to avoid damage to adjacent structures, component, equipment, and utilities. The Contractor shall minimize bending, twisting, and smashing of the steel during segregation and bulk storage.

E. Control of fugitive emissions shall be maintained at all times during this removal work to minimize visible dust.

F. All temporary bracing and rigging frames required shall be in accordance with Section 05125 of this specification package.

G. Cut all reinforcing (e.g., rebar) and anchors flush with base slab for areas designated on the Civil Demolition Plan for potential debris stockpiling. For all other areas, reinforcements and anchors need only be cut down to within one inch of the base slab. Fill in damaged areas of base slab with patching grout as described in Section 01515 of this specification package.

H. Lead-based paint chips and debris, released during structural steel dismantlement, shall be collected and managed in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

3.3 SPECIAL INSTRUCTIONS

A. The following items are also included (where applicable) in the sequence of structural steel dismantlement:

1. Doors, Windows, and Frames:

   a. The Contractor shall remove all windows in one piece and place them in appropriate containers.

   b. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

2. Lead Materials:

139

a. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

b. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut (i.e., 4 inches on each side).

c. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

B. All material shall be cut to meet sizing criteria and be managed in accordance with the Waste Management Plan located in Part 6 of the IFB/RFP.

3.4 QUALITY ASSURANCE

The Contractor shall inspect debris generation, stockpiling, and containerization to ensure that all materials have been cut to meet size criteria and are being managed in accordance with the Waste Management Plan located in Part 6 of the IFB/RFP.

END OF SECTION

SECTION 07415

TRANSITE REMOVAL

2203

PART I GENERAL

1.1 SCOPE

The work includes:

A. Removal of all interior and exterior transite panels.

B. Use of vacuuming, poly sheeting, encapsulants, and/or surfactants on the transite panels to prevent airborne asbestos fibers and airborne radioactivity.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01515 - Mobilization, Demobilization, and General Site Requirements.

C. Section 01516 - Asbestos Abatement.

D. Section 01517 - Removing/Fixing Radiological Contamination.

E. Section 15065 - Equipment/System Dismantlement.

F. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

See the Invitation for Bid/Request for Proposal (IFB/RFP) for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Contractor Safe Work Plan Format Requirements.
E. HEPA Vacuum Cleaner Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

A.

29 CFR 1926.850	Demolition Preparatory Operations.
29 CFR 1926.1101	Asbestos (Construction Industry).
29 CFR 1910.134	Use of Respirators.
29 CFR 1910.1001	Asbestos (General Industry).

141

B. Ohio Department of Health Asbestos Hazards Abatement Rules Chapter 3701-34, OAC (Ohio Department of Health).

C. Ohio Environmental Protection Agency Chapter 3745-20, OAC.

D. United States Environmental Protection Agency (U.S. EPA) 40 CFR 61 Subpart M (NESHAPS).

1.5 SUBMITTALS

A. The Contractor shall submit to Fluor Daniel Fernald (FDF) a detailed Safe Work Plan for approval in accordance with Part 7, Contractor Safe Work Plan Format Requirements, and Part 8, Asbestos Abatement Safe Work Plan Requirements, of the IFB/RFP, including the procedures proposed for use in complying with the requirements of this specification. The Safe Work Plan shall be prepared by an Ohio Certified Asbestos Abatement Project Designer. The plan shall include the following information:

1. The location and layout of storage and queuing areas.

2. The method of applying vacuuming, poly sheeting, encapsulants, and/or surfactants.

3. The methods and sequencing of interior and exterior panel removal.

4. The interface of trades involved in the performance of work.

5. A detailed description of the methods to be employed to prohibit visible emissions in the work area.

6. A detailed description of the methods for removing transite panels from the structures and moving them to the laydown location for size reduction and containerization (per the Waste Management Plan/Material Segregation and Containerization Criteria (WMP/MSCC) located in Part 6 of the IFB/RFP. The description of methods shall include methods to be employed to ensure transite panels are removed without cutting, abrading, or breaking.

7. Description of the portable HEPA ventilation system, the containerization of removed asbestos debris, the method of treating broken and/or damaged panels, and the method of protecting adjacent structures.

8. If dismantlement method requires personnel on the roof, the plan shall include calculations verifying the structural adequacy of the roof and roof penetrations to support personnel and equipment. These calculations shall be stamped by a Professional Engineer registered in the State of Ohio, consistent with Specification Section 01515.

9. Plans for personnel tie off, use of pick boards and walking on or near roof purlins/girders.

B. Prior to initiation of the work, the Contractor shall submit the following OSHA-required documentation for Asbestos Removal Contractors to FDF:

2203

1. Documentation of training.
2. Medical surveillance.
3. Respirator fit-test.
4. Employee exposure assessments.

C. Five (5) days prior to submittal of notification to government agencies, the Contractor shall provide a copy to FDF for concurrence.

D. Product Data: The Contractor shall submit for approval manufacturer's technical information, including application instructions for each material proposed for use.

1.6 QUALITY ASSURANCE

Mock-up: Prior to commencement of work, the Contractor shall provide for approval a FDF-selected sample area of transite for approval, 10 feet by 10 feet in size, to demonstrate encapsulant and/or surfactant methods. The approved mock-up shall serve as a standard for the balance of the work.

1.7 HANDLING AND STORAGE

A. The Contractor shall manage transite in accordance with Specification Section 01120 and the Waste Management Plan, located in Part 6 of the IFB/RFP. Corrugated transite panels shall be stacked separately from flat transite panels.

B. The Contractor shall take precautions to prevent breakage of transite panels during handling.

1.8 PROJECT CONDITIONS

Multiple layers of transite roof panels require specific methods for removal/fixing of radiological contamination which is likely to exist between the layers of transite. Specification Section 01517 contains specific instructions for removing/fixing contamination during removal of transite roof panels.

PART II PRODUCTS

2.1 MATERIALS

A. Deliver materials in original, new, and unopened containers bearing manufacturer's name, label, and the following information:

1. Name or title of material.
2. Manufacturer's stock number and date of manufacture.
3. Manufacturer's name.
4. Thinning and application instructions.

143

B. Encapsulants:

1. CP-240 by Chil-Lock by Childers.
2. Certane 2050 by Certified Technologies.
3. Eppco-1 by Expert Environmental Products.
4. Serpiloc by International Protective Coatings Corp.
5. 1050-Clearcoat by Certane.
6. Fiber-Seal by Eppert.

Note: Encapsulants shall have a coloring agent or dye so that, when applied, there is obvious verification that a coating has been applied.

C. Surfactants:

1. CP-225 CHIL-SORB by Childers.
2. FDF-approved equal products.

D. Fiber-reinforced polyethylene or polyester sheeting approved for outdoor storage: color, yellow; minimum thickness of 6 mils; ultraviolet resistant, as manufactured by Griffolyn or Herculite.

E. Or equal, as approved by FDF.

PART III EXECUTION

3.1 PREPARATION

A. Regulatory:

1. When applicable, the Contractor shall notify the Ohio Department of Health (ODOH) and FDF shall notify the EPA and all other applicable governmental agencies before the start of work.

2. The Contractor shall adhere to and comply with work practices and procedures set forth in the most current and applicable Federal, State, and local codes, regulations, and standards.

3. The Contractor shall obtain certifications and licenses if transite becomes friable.

B. Consistent with Specification Section 01517, prior to opening a building to the environment by removing the exterior siding (e.g., transite, metal siding, roof panels), the Contractor shall remove and/or fix radiological contamination on all structural surfaces within the facility until the detected radioactivity levels are below the criteria defined in Part 8 of the IFB/RFP.

3.2 APPLICATION

A. The Contractor shall apply poly sheeting, encapsulants, and/or surfactants according to the product manufacturer's specifications for application conditions (e.g., temperature).

B. Where transite panels show significant deterioration, which results in potentially friable surfaces, panels shall be removed in accordance with Specification Section 01516.

C. Apply encapsulant and/or surfactant to areas around fasteners of transite panels before removal of fasteners.

1. If cut, fasteners shall be cut in a manner which minimizes abrading the transite panel. A flat, sharp instrument shall be used to cut the fasteners.

2. When encapsulant and/or surfactant is applied, it shall be applied to provide visible coverage. If original application becomes dried out before or during removal or handling, apply a second application.

D. Prior to removal of transite panels, all surfaces of the panels shall be thoroughly wet or encapsulated.

1. Bodily contact with the panels, as practical, shall be avoided.

2. When dust is observed between panels, collect the dust with a HEPA-filtered vacuum.

3. In the event a transite panel is broken or deteriorated, the Contractor shall apply encapsulant and/or surfactant to the edges of deteriorated areas.

4. Removed transite panels shall be encapsulated or wrapped in 6-mil poly sheeting by the end of the work shift.

E. Removal of transite roof panels shall be sequenced to minimize exposed underlying surfaces.

F. Cleanup procedures:

1. Remove and containerize all visible accumulations of asbestos containing material (ACM) and asbestos-contaminated material.

2. Wet clean all surfaces in the work area.

3. Inspect the work area for visible residue.

4. The work area shall be cleaned until visual inspection reveals no evidence of any ACM as determined by FDF.

3.3 SPECIAL INSTRUCTIONS

A. Single and Multiple Transite Layers:

Refer to the requirements contained in Specification Section 01517 for removing/fixing radiological contamination on single and multiple transite panels.

B. Gutters:

The Contractor shall remove and collect all ACM from gutters, and apply an encapsulant and/or surfactant to the gutters before their removal.

C. Insulation:

1. The Contractor shall remove the mineral wool insulation between the transite panels and/or other materials.

2. The Contractor shall use dust control techniques (minimum of applying amended water) to minimize airborne contaminants generated during insulation removal.

D. Doors, Windows, and Frames:

1. The Contractor shall remove all windows in one piece and place them in appropriate containers.

2. The Contractor shall remove all doors (wood and/or steel) and place them in appropriate containers.

E. Lead Materials:

1. The Contractor shall segregate all lead materials (i.e., flashing, vent stacks, etc.) and place them in appropriate containers in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

2. Prior to torch cutting on a surface coated with a lead-based paint, an eight-inch strip of paint shall be removed at the area of the cut.

3. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

F. All material shall be managed in accordance with the Waste Management Plan located in Part 6 of IFB/RFP.

END OF SECTION

SECTION 15065

EQUIPMENT/SYSTEM DISMANTLEMENT E- 2203

PART I GENERAL

1.1 SCOPE

A. This section includes the Contractor's responsibility for removal or dismantlement of equipment and demolition debris from a facility and support systems within or outside a facility.

B. Segregation of demolition debris into various waste streams and preparation for containerizing shall include, but not be limited to, the following:

1. Conduit.
2. Wire.
3. Electrical boxes (junction, switch).
4. Contacts.
5. Lighting fixtures.
6. Motor operated valves.
7. Lighting station.
8. Raceway and troughs.
9. Cable trays.
10. Piping.
11. Assorted valves, fittings, elbows, gauges, spool pieces, etc.
12. Ductwork, plenums, branches, etc.
13. Miscellaneous similar items.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01515 - Mobilization, Demobilization, and General Requirements.

C. Section 01516 - Asbestos Abatement

D. Section 01517 - Removing/Fixing Radiological Contamination.

E. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIAL

See the IFB/RFP for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. HEPA Vacuum Cleaner Requirements.

147

E. HEPA Air Filtration Device Requirements.
F. Contractor Safe Work Plan Format Requirements.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. 29 CFR 1926.301 Hand Tools.
B. 29 CFR 1926.302 Power Operated Hand Tools.

1.5 SUBMITTALS

The Contractor shall submit the following for approval:

A. Detailed removal Safe Work Plan in accordance with IFB/RFP Part 7, Contractor Safe Work Plan Format Requirements for dismantlement of equipment/systems.

B. Catalog cuts of materials and equipment furnished.

C. Proposed location, and method of installation of all hoisting equipment, and specialized construction equipment submitted for approval by Fluor Daniel Fernald (FDF) with the Safe Work Plan.

D. Safe Work Plan specific to the decontamination and dismantlement of outdoor process or suspect process tanks and pipes in accordance with IFB/RFP Part 7, Subcontractor Safe Work Plan Format Requirements, including:

1. Sequence of work.
2. Methods and materials to control spills and possible generation of fugitive emissions from opening and cutting operations.
3. Method to access tanks and pipes, including health and safety issues.
4. Method for decontamination and effluent control.
5. Methods of dismantlement.
6. Method to size reduce and segregate.
7. Locations of cutting and interim storage areas.
8. Equipment required.
9. Methods to seal equipment and pipe openings for each equipment type.
10. Method to be used if piping or equipment contains nitric acid.
11. Location for interim storage.
12. Allowable floor loads.
13. Catalog cut sheets.
14. Drawings.

1.6 QUALITY ASSURANCE

Calculations submitted on maximum allowable floor loading must bear the stamp of a Professional Engineer registered in the State of Ohio.

1.7 PROJECT CONDITIONS

Process material (i.e., green salt, yellow cake, black oxide) has been removed from process equipment to the maximum extent practical by FDF prior to D&D activities. If process material is found during D&D activities, FDF shall be notified prior to disturbing the condition.

PART II PRODUCTS

2.1 MATERIALS

A. The Contractor shall supply all materials required to seal equipment openings, to prevent spillage and/or migration of contaminants, per requirements of this section.

B. Fiber-reinforced polyethylene or polyester material approved for outdoor storage: color, yellow; minimum thickness of 6 mils; ultraviolet resistant; as manufactured by Griffolyn, Herculite, or FDF-approved equal.

PART III EXECUTION

3.1 APPLICATION

A. The Contractor shall supply all items necessary for the performance of the work.

B. The Contractor shall use mechanical means of cutting whenever possible.

C. All equipment and systems such as ductwork and piping shall be dismantled, staged, size-reduced, segregated, and either containerized or stockpiled according to the requirements of Specification Section 01120 and the Waste Management Plan (Part 6 of the IFB/RFP). The Contractor may propose to leave non-process equipment/systems, as defined in Specification Section 01120, in place for structural dismantlement. Process and suspect process piping and ductwork shall have their ends (openings) sealed at both ends prior to movement from the immediate work area. Sealing material shall be sufficiently durable to maintain its integrity during handling, containerization, and exposure to weather. Equipment/systems will be inspected by FDF for visible process residues and size criteria per Specification Section 01120 in the project-established inspection area (which would reside in the enclosure if containment is required) per Specification Section 01120. Criteria for decontamination are detailed in Specification Section 01517.

D. Prior to equipment/system dismantlement, the Contractor shall take the necessary actions to preclude spillage of residual material, if encountered. This shall include the temporary sealing of openings, pipe ends, etc.

149

E. Prior to cutting into tanks or piping where the potential for flammable lining exists, it shall be the Contractor's responsibility to verify that no lining exists. Should the Contractor find lined pipes or tanks, the pipes or tanks shall be cut and removed by mechanical means and shall not be torch cut.

F. In some cases, equipment may be elevated from the ground by the means of a structural platform. In these cases, the equipment should be cut away or disconnected from the platform and lowered to the ground. The dismantlement of this equipment shall be accomplished by shearing and cutting whenever possible. If this is not possible, the equipment shall be dismantled at convenient assembly joints.

G. FDF Radiological Control shall be contacted prior to performing any torch cutting on contaminated surfaces.

H. Prior to cutting into piping or equipment known or suspected of containing nitric acid or other corrosive, toxic, flammable or combustible material, such systems shall be purged to remove any potentially explosive or otherwise potentially harmful gases.

I. Equipment which can be removed in one piece during dismantlement of the building will be identified in Part 6 of the IFB/RFP; however, handling of such equipment must still follow all other applicable requirements in Specification Section 01120.

J. Uncontrolled dropping of materials is not allowed.

K. Piping insulated with asbestos may be removed in its entirety per the requirements of Specification Section 01516 of this specification package.

L. The Contractor shall take the necessary actions to preclude spillage of residual material, if encountered.

M. Debris segregation, sizing, and management shall be in accordance with Specification Section 01120 and the Waste Management Plan located in Part 6 of the IFB/RFP.

N. HEPA-filtered local ventilation shall be implemented for disassembly and sizing of process and suspect process pipe and equipment and for all burning (e.g., torch cutting) activities on contaminated surfaces.

3.2 INTERIM MATERIAL STORAGE

A. Where removed materials are staged or stored within the facility, they shall be stored in designated floor storage areas as described in Specification Section 01120.

B. Damaged areas within facilities identified by the Contractor's Engineering Survey shall not be used for interim material storage.

3.3 SPECIAL INSTRUCTIONS

Lead Materials:

A. The Contractor shall segregate all lead materials (e.g., flashing, vent stacks) and place them in appropriate containers in accordance with Section 01120 of this specification package and the Waste Management Plan located in Part 6 of the IFB/RFP.

B. Lead impregnated cloth, used for noise dampening, shall be removed from equipment prior to equipment/system dismantling. Equipment/systems known to have lead impregnated cloth will be identified in Part 6 of the IFB/RFP; however, this identification may not be totally inclusive of all such material.

C. Prior to torch cutting on a surface coated with a lead-based paint, an eight inch strip of paint shall be removed at the area of the cut.

D. The Contractor shall (whenever possible) dismantle lead flashing in a manner that will facilitate recycling. This will include minimizing inaccessible surfaces and maximizing straight lengths. This will also include avoiding the use of fixatives on the lead flashing that would require an abrasive method of removal.

END OF SECTION

SECTION 15067

VENTILATION AND CONTAINMENT

PART I GENERAL

1.1 SCOPE

A. This section consists of the work related to the Contractor-supplied ventilation and local containment that is required for radiological contamination purposes. The principal items included in this section are:

1. Local containment and vestibule design requirements.
2. Ventilation requirements.
3. Types of ventilation/local containment design.
4. Guidance on type of ventilation/local containment applicability.
5. Exterior items; such as, dust collectors.

B. Definitions:

1. Local Containment - is an enclosure that is designed to maintain 0.1 inch water gauge negative pressure, or six air changes per hour, within its structure to prevent fugitive emissions from escaping to the outside environment.

2. Vestibule - is an enclosed entrance, a passage, or space that is between the outer door and the interior of the building. The space within the vestibule does not have to be under a negative pressure.

3. Enclosure - is the exterior wall of a building forming the containment.

1.2 RELATED SECTIONS

A. Section 01120 - Debris/Waste Handling Criteria.

B. Section 01515 - Mobilization, Demobilization, and General Site Requirements.

C. Section 01517 - Removing/Fixing Radiological Contamination.

D. Section 03315 - Concrete/Masonry Removal.

E. Section 05126 - Structural Steel Dismantlement.

F. Section 07415 - Transite Removal.

G. Section 15065 - Equipment/System Dismantlement.

SECTION 15067

2203

1.3 REFERENCE MATERIALS

See Invitation for Bid/Request for Proposal (IFB/RFP) Package for the following:

A. Index of Drawings.
B. Photographs.
C. Drawings.
D. Air Cleaning Device Procurement Specification.
E. Air Cleaning Device Filter Procurement Specification.

1.4 REFERENCES, CODES, AND STANDARDS

All work shall be accomplished in accordance with the following reference, code, and standard requirements:

A. United States Department of Energy (DOE):

1. DOE 5400.5 Radiation Protection of the Public and the Environment.

2. DOE/EH 0256T Radiological Control Manual, April 1994.

B. Energy Research and Development Administration (ERDA):

ERDA 76-21-79 Nuclear Air Cleaning Handbook.

C. American Conference of Governmental Industrial Hygienists (ACGIH):

ACGIH Industrial Ventilation (latest edition).

D. American Society of Civil Engineers (ASCE):

OBBC Ohio Basic Building Code.

1.5 SUBMITTALS

The Contractor shall submit a Safe Work Plan in accordance with IFB/RFP, Part 7, Contractor Safe Work Plan Format Requirements, with the following information to Fluor Daniel Fernald (FDF) for approval.

A. Drawings and Data:

1. Indicate materials of construction, sizes, locations, entrances, and egresses that do not allow for breach of the local containment or vestibule, and all other details of local containments and vestibules to be erected.

2. Provide air flow diagrams for local containment and vestibule ventilation.

3. Submit calculations indicating that a minimum negative pressure of 0.1 inch water gauge or six air changes per hour is maintained in all local containments when the ventilation system is in operation.

4. All drawings and calculations shall bear the stamp of a Professional Engineer registered in the State of Ohio.

5. If any part of this affects or involves asbestos activities, the Ohio Department of Health/OSHA Asbestos Hazard Abatement Project Designer certification shall be part of the documentation submitted with the Safe Work Plan.

B. Submit vendor information for performance, operation and maintenance on all accessory ventilation equipment that will be used.

C. Provide building-specific Safe Work Plans on the use of portable HEPA units including replacement of HEPA filters and prefilters.

PART II PRODUCTS

2.1 MATERIALS

A. The Contractor shall provide:

1. Air cleaning devices.
2. HEPA elements.
3. Prefilter elements.
4. all other ventilation accessory equipment for the completion of this project in accordance with Part 7 of the IFB/RFP.

B. Polyethylene sheeting shall be clear and have a minimum of 6 mils thickness as manufactured by Blueridge Films, Inc. or FDF-approved equal.

1. Fire retardant polyethylene shall be used.
2. All outside containments shall be constructed of reinforced polyethylene.

PART III EXECUTION

3.1 EXAMINATION

A. All vestibules, equipment, and/or structure containment material shall be fire resistant and corrosion resistant.

B. Local containment structures shall be designed to be leak-tight and capable of maintaining a negative pressure of at least 0.1 inches water gauge or six air changes per hour. Typical design for various local containments should include the following features, where applicable:

1. Windows and mountings.
2. Glove ports.
3. Ease of cleaning.
4. Interior illumination per 29CFR 1926.56.
5. Connections for services lines, conduits, instrument leads, and ductwork.
6. 6 mil polyethylene sheeting.
7. Pressure differential readouts.
8. Attachments for interconnection of local containments.

C. Where practical, and without penetrating the local containment, all equipment components not functionally required to operate directly in the presence of radioactive materials shall be located outside the local containment.

D. The local containment or vestibule structure external to the building shall be designed to withstand the effects of normal operating conditions and the following load capacities:

1. Interior: 5 psf lateral load.
2. Exterior: per DBBC.

3.2 PREPARATION

A. The Contractor shall enclose the structure and ensure that all building exterior holes, gaps, or openings are adequately sealed to prevent exhaust of airborne radioactive particulates.

B. The Contractor shall ensure that all ductwork used is free of dust or dirt before installing it in the ventilation system to prevent premature impingement loading of the prefilters and HEPA filters.

C. The Contractor shall ensure that all vestibules are large enough to support appropriate storage containers, material handling and dismantling equipment, and debris containerizing operations.

3.3 INSTALLATION/APPLICATION

A. The Contractor shall block, tie-down, or wheel lock all portable HEPA units.

B. The following guidelines for localized ventilation and in-place cutting control measures shall be adhered to by the Contractor:

1. The Contractor shall ensure that ventilation air is provided in the quantities required to maintain OSHA air quality limits, all Permissible Exposure Limits (PELs), and all ACGIH

Threshold Limit Values (TLVs) and to maintain exposures As Low As Reasonably Achievable (ALARA).

2. For activities outside of enclosures, nuclear grade HEPA filters with a flexible ventilation duct shall be used as follows:

   a. Exhaust rate of the HEPA filters with a flexible ventilation duct shall maintain sufficient airflow capture velocity to prevent entry of fumes into the room. A minimum face velocity of 150 fpm is required.

   b. Each HEPA filter with a flexible ventilation duct in the cutting area should be capable of being isolated by means of control dampers to prevent backflow through a hood when it is not in service.

C. The Contractor shall ensure that all local containments can maintain negative pressures. The exhaust volume rate shall be as required to attain 0.1 inch negative pressure within the conmtainment. The exhaust air stream must be HEPA filtered. When containments are out-of-doors or border the outdoors, or are to be used for torch-cutting in the size reduction area, containments must have an airlock for the passage of equipment, personnel, and materials, so the main body of the containment is never directly open to the atmosphere. Other containments must be maintained such that there are no undesigned holes in the containment and the entrance/exit-way closes sufficiently to meet the air exchange/negative pressure requirements.

3.4 FIELD QUALITY ASSURANCE

Final acceptance of local containments, building enclosures, and vestibule structures shall be obtained from FDF.

END OF SECTION

APPENDIX D

DESIGN DRAWINGS

2203

TABLE D-1 PLANT 6/EW COMPLEX DRAWINGS

DRAWING NO./ INDEX CODE	REV.	DESCRIPTION
06X-5500-X-08262	0	Plant 6 Area Complex Civil Demolition Plan
06X-5500A-08149	4	Plant 6 Metals Fabrication Plant Floor Plan
06X-1450-P-00422	0	Sectional Elevation Metals Fabrication Plant
06X-1450-P-00420	0	Elevations Metals Fabrication Plant
06X-1450-P-00412	0	Plant 6 Section View "F-F" Between Columns 3 & 5
06X-1450-P-00413	0	Plant 6 Elevations
06X-1450-P-00415	0	Plant 6 Section View "C-C" Between Columns 15 & 16
06X-1450-P-00416	0	Plant 6 Section View "E-E" Between Columns 16 & 17
06X-1450-P-00419	0	Plant 6 Elevations
06X-1450-P-00418	0	Plant 6 Elevations
06X-1450-P-00423	0	Plant 6 Sectional Elevation
06X-7000-S-00547	0	Plant 6 Ingot Storage Area Structural Steel Details
06X-7000-S-00548	0	Plant 6 Ingot Storage Area Structural Steel Details
20D-3115-S-00168	0	Component 20D Elevated Potable Storage tank
77X-5500-A-00011	1	Building 77 Finished Products Warehouse Floor Plan
79x-4445-A-00012	4	Building 79 Plant 6 Warehouse Elevations
82X-5500-A-00078	1	Building 82A Receiving/Incoming Mat'l Inspection Floor Plan
82X-4445-A-00026	0	Building 82A Receiving/Incoming Mat'l Inspection Elevations

D

R

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F

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2203

LIST OF BUILDINGS TO BE REMOVED

6A	METALS FABRICATION PLANT
6B	PLANT 6 COVERED STORAGE AREA
6C	PLANT 6 ELECTROSTATIC PRECIPITATOR (SOUTH)
6D	PLANT 6 ELECTROSTATIC PRECIPITATOR (CENTRAL)
6E	PLANT 6 ELECTROSTATIC PRECIPITATOR (NORTH)
6F	SALT OIL HEAT TREAT BLDG.
6G	PLANT 6 SUMP BLDG.

OPTIONS

28D	ELEVATED POTABLE WATER STORAGE TANK
77	FINISHED PRODUCTS WAREHOUSE
79	PLANT 6 WAREHOUSE
82A	RINSA
83	KC2 WAREHOUSE (SEE DWG. 75C-5500-G-00096)
	PIPE BRIDGES

1. EXISTING CONDITIONS SHOWN ON THIS DRAWING WERE PREPARED FROM FEMP SITE PROVIDED DATA FROM THE DOCUMENTS LISTED BELOW.

   EXISTING SITE DATA SOURCE OR PLANT FILES:
   FEMP EXIST UTILITY DRAWINGS
   FEMP CONTRACTOR PROJECT DESIGN DOCUMENTS

2. INFORMATION ON THE LOCATIONS OF EXISTING FEATURES SHOWN ON THIS PLAN WERE TAKEN FROM FERNALD SITE DRAWINGS. NO FIELD VERIFICATION BY SURVEY HAS BEEN PERFORMED.

3. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS (INCLUDING ELEVATIONS) BEFORE STARTING CONSTRUCTION AND/OR FABRICATION. ANY DEVIATIONS NOTED SHALL BE BROUGHT TO FLUOR DANIEL, FERNALD CONSTRUCTION MANAGER'S ATTENTION IN WRITING IMMEDIATELY AND RESOLVED BEFORE CONTINUING WITH CONSTRUCTION.

4. EXISTING HARD SURFACE PAVEMENTS (ASPHALT, CONCRETE, ETC.) TO REMAIN UNDISTURBED UNLESS APPROVED BY FLUOR DANIEL, FERNALD CONSTRUCTION MANAGER.

5. CONTRACTOR SHALL PROTECT ALL UNDERGROUND UTILITIES AND MONITORING WELLS. SEE DRAWING 22C-5500-P-00002, 22C-5500-P-00003, 22H-5500-P-00005, 22C-5500-P-00006, AND 28E-5500-P-00671 FOR UTILITIES.

6. LAYDOWN AREAS SHALL BE PROPOSED BY CONTRACTOR WITH APPROVAL BY FLUOR DANIEL, FERNALD CONSTRUCTION MANAGER.

7. AT THE COMPLETION OF THE PROJECT, CONTRACTOR SHALL REMOVE AND STORE THE TEMPORARY CONSTRUCTION FENCE AND GATES IN THE LOCATION DESIGNATED BY FLUOR DANIEL, FERNALD CONSTRUCTION MANAGER. PERMANENT FENCING SHALL BE LEFT IN PLACE.

8. FOR DIMENSIONS AND DETAILS OF BUILDING FACILITIES REFERENCE THE EXISTING FILE DRAWINGS.

9. CONTRACTOR SHALL VERIFY THAT THE UTILITIES TO BUILDINGS AND PIPE BRIDGES HAVE BEEN PROPERLY DISCONNECTED AND END CAPPED. UTILITY DISCONNECT AND CAPPING WORK BY FLUOR DANIEL, FERNALD.

10. ASBESTOS HYGIENE FACILITY/FACILITIES TO BE PROVIDED BY CONTRACTOR ACCORDING TO SPECIFICATION SECTION 01564, AND LOCATIONS SHALL BE APPROVED BY THE FLUOR DANIEL, FERNALD CONSTRUCTION MANAGER.

11. CONTRACTOR OFFICE FACILITY TO BE PROVIDED BY CONTRACTOR (REF. ACR-0060)

12. WASTE CONTAINER QUEUING AREA TO BE PROVIDED BY CONTRACTOR (SPEC. 01123)

13. LIGHT/UTILITY POLES AND CABLE TO BE PROTECTED

LEGEND

- 2439 — MONITORING WELL LOCATION (TO BE PROTECTED FROM DAMAGE)
- POST INDICATOR VALVE (TO BE PROTECTED FROM DAMAGE)
- FIRE HYDRANTS (TO BE PROTECTED FROM DAMAGE)
- FACILITIES TO BE DEMOLISHED
- FACILITIES TO BE PROTECTED FROM DAMAGE UNTIL OPTION AWARDED
- DELIVERY/ACCESS ROUTE
- PROTECTED DURING D & D
- HISC COMPONENTS TO BE PROTECTED FROM DAMAGE UNTIL OPTION AWARDED
- HISC TO BE REMOVED
- PERMANENT CONTAMINATION ZONE CONSTRUCTION FENCE
- PERMANENT FENCING AROUND ALL SUBSURFACE OPENINGS AFTER D&D COMPLETE
- (A) LOW PRESSURE WATER TIE IN
- (B) POWER SUPPLY HOOK-UP
- (C) SAN. SEWER TIE IN
- (D) STORM SEWER TIE IN (CATCH BASIN)
- (E) REFUELING STATION CONNECTS TO BE PROTECTED FROM DAMAGE

PRELIMINARY
INFORMATION ONLY
CADD SERVICES

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUE CFC			

NOTE: FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

APPROVALS

CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINT/CHANGE	
ENGINEER		FIRE PROTECT.	
INSTRUMENT/ MECHANICAL		WASTE MANAGE	
		SECURITY PROJECTS	
		ENGINEER	
CHECKED			
APPROVED			

Fernald Environmental Management Project

U.S. DEPARTMENT OF ENERGY

PLANT 6 AREA

PLANT 6 AREA COMPLEX
CIVIL DEMOLITION PLAN
NO SCALE

RES 3793	06X-5500-X-08262 0
DATE Nov. 20, 1998	
DRAWN Jane	

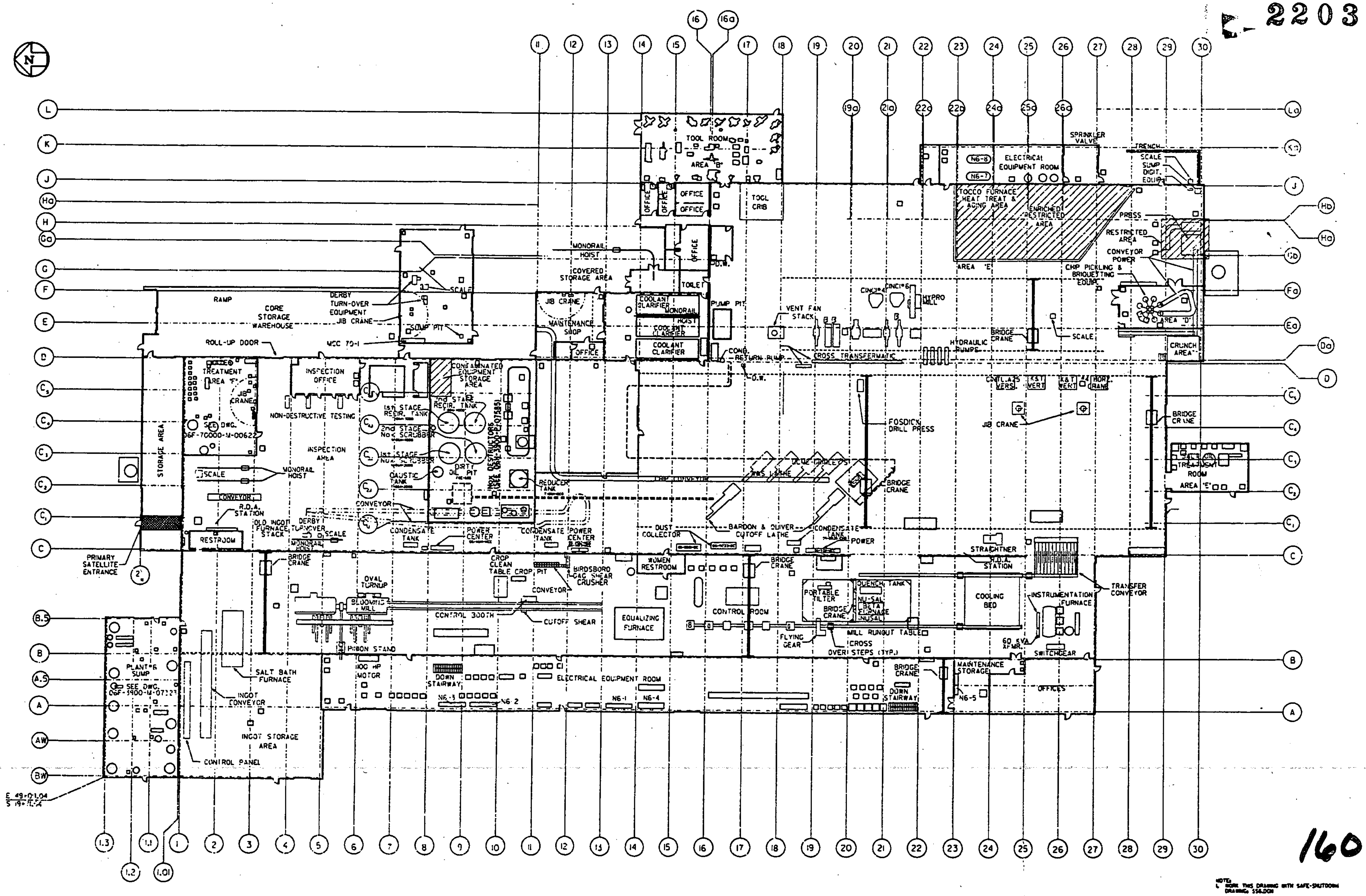
FILE NAME: rea3516/6xx8262.dgn

INFOR
O

159

2203

160



NOTE:
1. [illegible] THIS DRAWING WITH SAFE-SHUTDOWN DRAWING 556.DGN
2. REMOVED EQUIPMENT ON LEVEL 35.

NOTE:
WEMCO C.A.D.
DRAWING NOT
TO BE REVISED
MANUALLY

NO.	REVISIONS	DATE	DWN. BY	APPD.
4	GENERAL REVISIONS	[illegible]	JMP	GEP
3	UPDATED	[illegible]	SJS	GEP
2	REVISED COORDINATES & SALT TREATMENT ROOM	[illegible]	RJW	GEP
1	PLANT #6 COMPLETE UPDATE	[illegible]	JSW	GEP

REF. DWG. NO.

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		Q.A.	
INSTRUMENT			
MECHANICAL		FIRE PROTECT.	
		WASTE MANAGE	
		D.O.E.	
CHECKED	GEP		
APPROVED	C.E.PAIK		SECURITY

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

PLANT 6 — FIRST FLOOR
METALS FABRICATION PLANT
FLOOR PLAN
SCALE 1"=20'

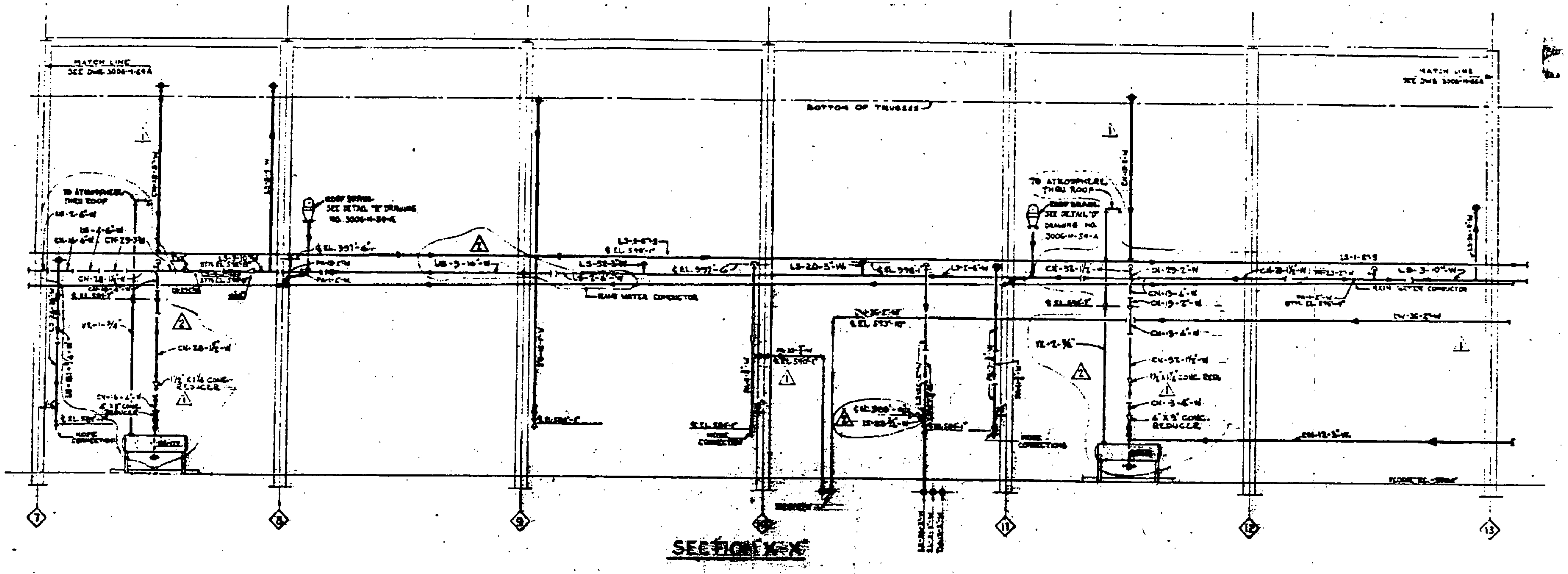
06X-5500-A-08149 | 4

FILE NAME: ..floor6.DGN

②

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DWG. 3006-H-50-R

2203



INFORMATION ONLY

161

No.	Date	Description	Made by	Appd
5				
4				
3				
2	4-16-52	RELOCATED PIPING TO G-6-177 & REVISED PIPING TO SHOW LINES DESIGNATED LS-51, LS-2, LS-4, LS-3, LS-52, CN-28, CN-16, CN-24, CN-32 AND CN-13	DRAWER	
1	2/1952	ADDED CN-5-2", CN-9-3", CN-36-2", PA-33-¾", VE-1-¾", VE-2-¾". MADE GENERAL CHECKING REVISIONS.	N.J.S.	

REVISIONS

APPROVED FOR A. E. C. BY ________
DATE ________

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060
FEED MATERIALS PRODUCTION CENTER.
FERNALD AREA

SECTIONAL ELEVATION.
METALS FABRICATION PLANT.

DATE 12-18-51
SCALE ⅛"=1'-0"
CATALYTIC CONSTRUCTION CO.
1528 WALNUT STREET
PHILA 2 PA.
J. CLEMENTS
APPROVED FOR CONSTRUCTION

DRAWING NO. 3006-H-65A
REVISION NO. 2

PRINT RECORD

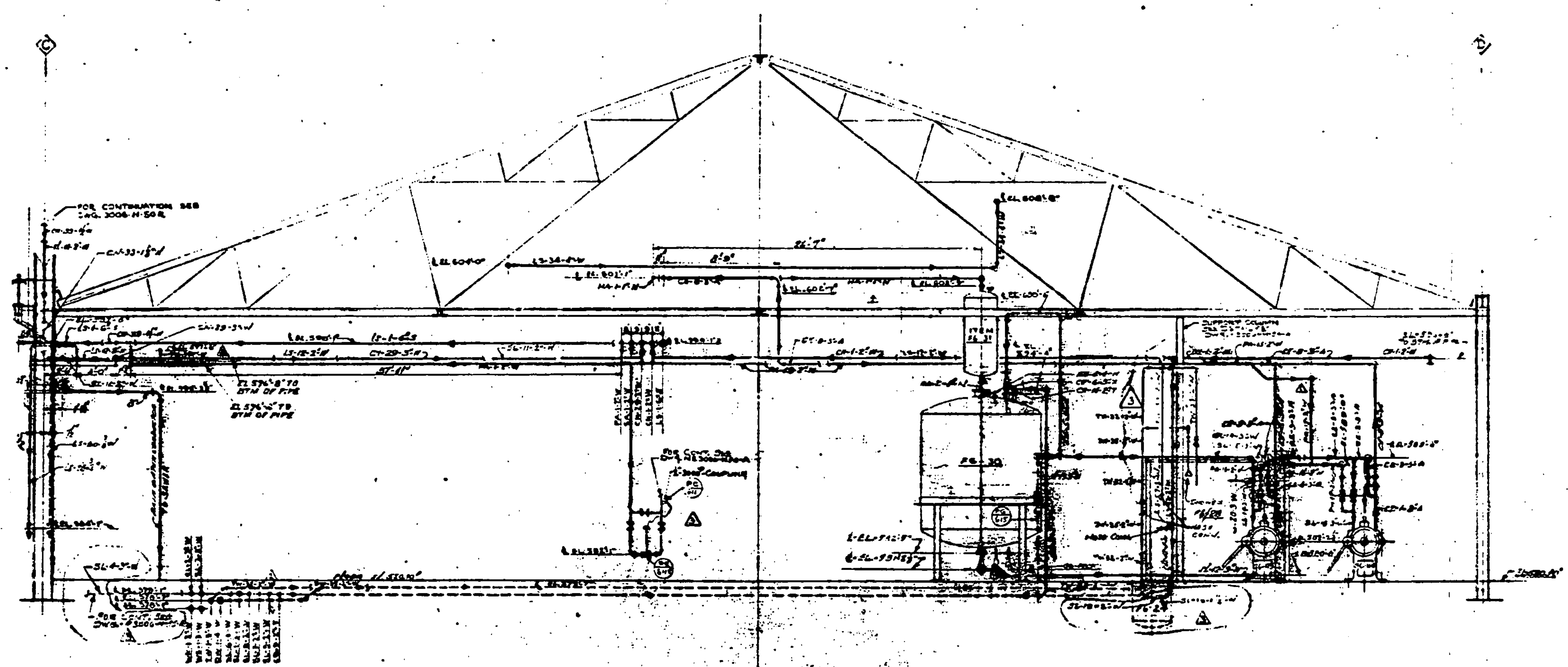
INDEX CODE
06X 1450 P 00422

3006-H-63-A

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DWG. 3006-H-50-R

2203

INFORMATION ONLY



SECTION "A-A"

SCALE FOR THIS DRAWING

162

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4				
3		[illegible]		
2	2-5-51	[illegible]		
1		TREATED WATER AND SANITARY WATER LINES TO PRECIPITATION AREA ADDED. SAFETY SHOWER ADDED. PETITION ADDED ON INST AIR LINE		

REVISIONS

APPROVED FOR A.E.C. BY ...

DATE ...

UNITED STATES ATOMIC ENERGY COMMISSION

NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1060

FEED MATERIALS PRODUCTION CENTER

FERNALD AREA

ELEVATIONS

METALS FABRICATION PLANT

DATE 12-15-51

SCALE 1/4" = 1'-0"

OFFICE OF CATALYTIC CONSTRUCTION CO. 1528 WALNUT STREET PHILA 2 PA.

DRAWN T.H. EDWARDS

APPROVED FOR CONSTRUCTION

DRAWING NO. 3006-H-63-A

REVISION NO. 3

PRINT RECORD

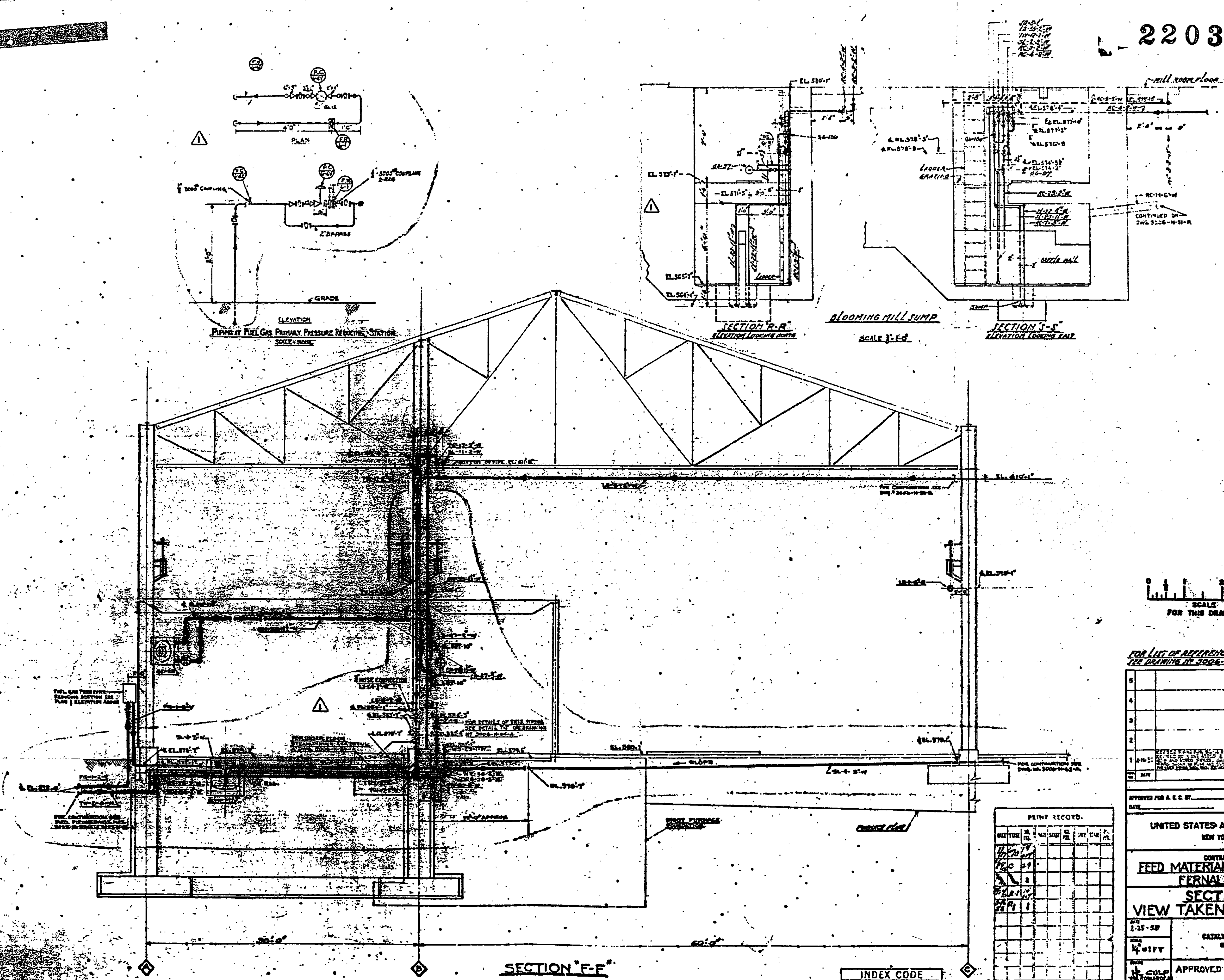
INDEX CODE

06X | 1450 | P | 00420

3006-H-55-A

[redacted]

2203



INFORMATION ONLY

SCALE FOR THIS DRAWING

163

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DRAWING № 3006-H-50-R.

REVISIONS

APPROVED FOR A. E. C. BY

DATE

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1069

FEED MATERIAL PRODUCTION CENTER
FERNALD AREA

SECTION "F-F"
VIEW TAKEN BET. COLS. 3 & 5

DATE 2-25-58
SCALE 1/4" = 1 FT

OFFICE OF CATALYTIC CONSTRUCTION CO.
PHILA. PA.

APPROVED FOR CONSTRUCTION

PRINT RECORD

INDEX CODE

CGX	1450	P 00412

DRAWING No. 3006-H-55-A

REVISION No. 1

3006-H-56-A

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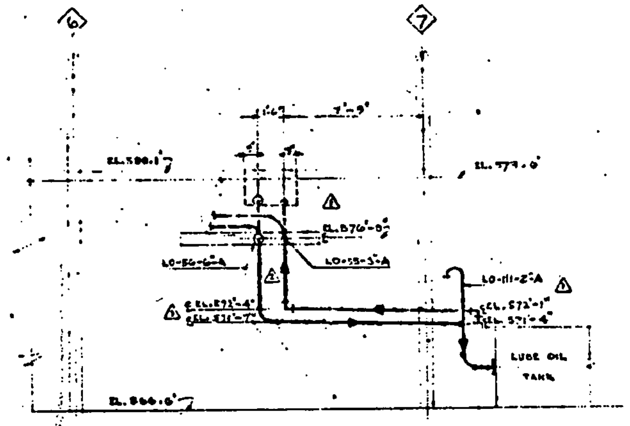
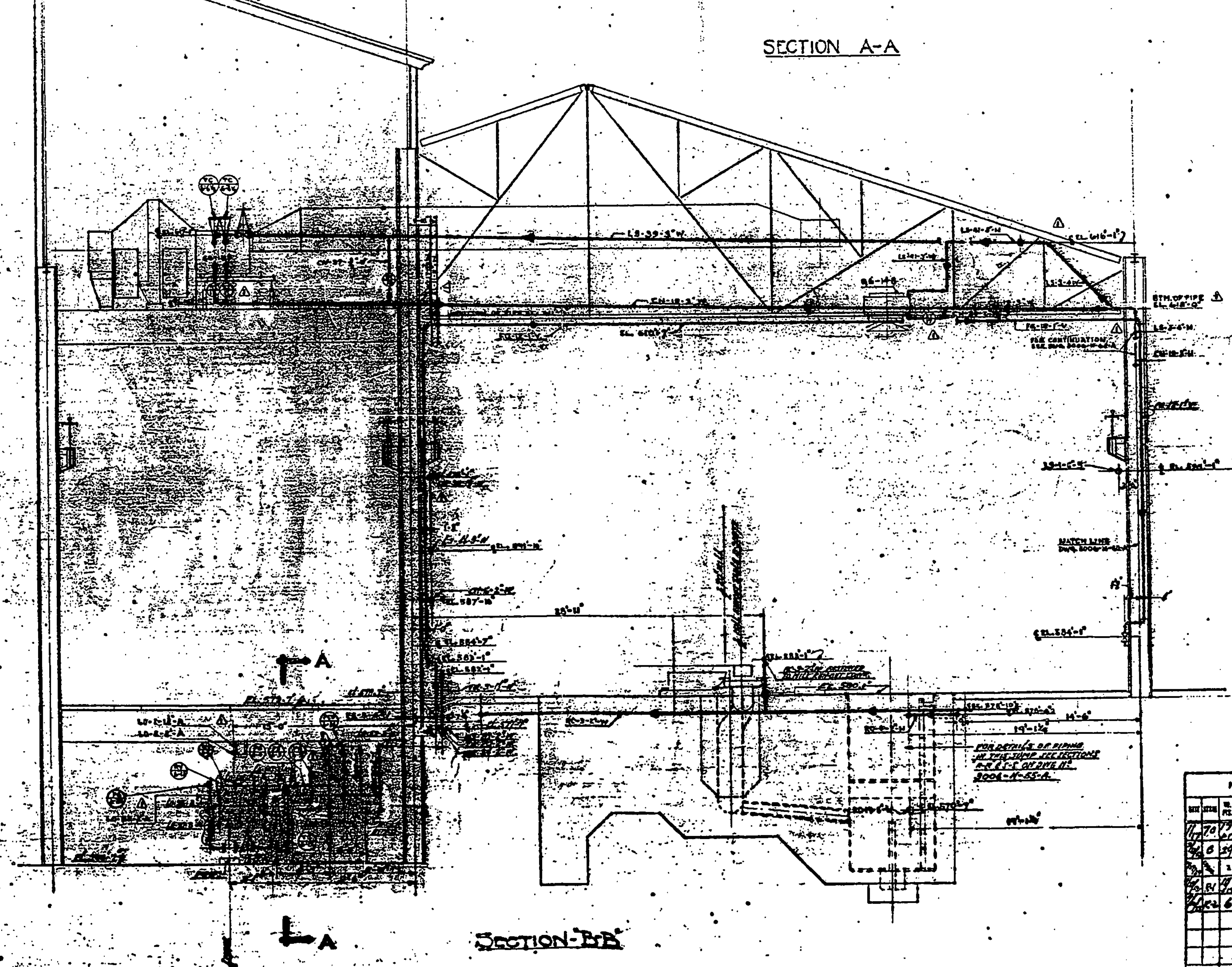
[redacted]

2203



SECTION A-A



SECTION-"B-B"

INFORMATION ONLY

SCALE FOR THIS DRAWING

164

2	9/10/53	REVISED TO SUIT "AS BUILT" INFORMATION CONTAINED IN FIELD DRAWING 3006-H-18-D.		
1	4-6-53	ADDED STEAM TRAP & LINE CN-30 FROM G-6-100. ADDED LINE DESIGNATIONS FOR LS-3, CN-19 AND WTS FOR SAME. ADDED LINE DESIGNATION LS-41 AND REVISED LS-3. ADDED STEAM TRAP NO. AND REVISED CN 19 FROM G-6-100. ADDED LOCATION AND ELEVATION FOR CN-33. ADDED INSTRUMENT LINE NOS. AND LINE DESIGNATIONS LO-108, LO-59 AND LINE SIZES FOR LO-57 AND LO-55 FOR LUBE OIL SYSTEM IN MOTOR ROOM BETWEEN COLUMNS A & B. ADDED LINE DESIGNATION LO-111 AND ELEVATIONS FOR LUBE OIL LINES SKETCH A-A. REVISED SIZE AND ADDED LINE DESIGNATIONS FOR TW-17 AND TS-11.		
REV. NO.	DATE	DESCRIPTION	MADE BY	APP'D

REVISIONS

APPROVED FOR A. E. C. BY:____
DATE____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1068
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ELEVATIONS
METAL FABRICATION PLANT

DATE 2-12-52
SCALE 1/4"=1'-0"
DRAWN J.G. Johnson
TRACED
CHECKED

OFFICE OF CATALYTIC CONSTRUCTION CO. PHILA. 2, PA.

APPROVED FOR CONSTRUCTION

DRAWING No. 3006-H-56-A

REVISION No. 2

PRINT RECORD

DATE	ISSUED	NO. PTS.	DATE	ISSUED	NO. PTS.	DATE	ISSUED	NO. PTS.
11/17	70	19						
	6	29						
		1						
	RV	19						
	R2	6						

INDEX CODE

06X	1450	P	00413

3006-H-58-A

[redacted]

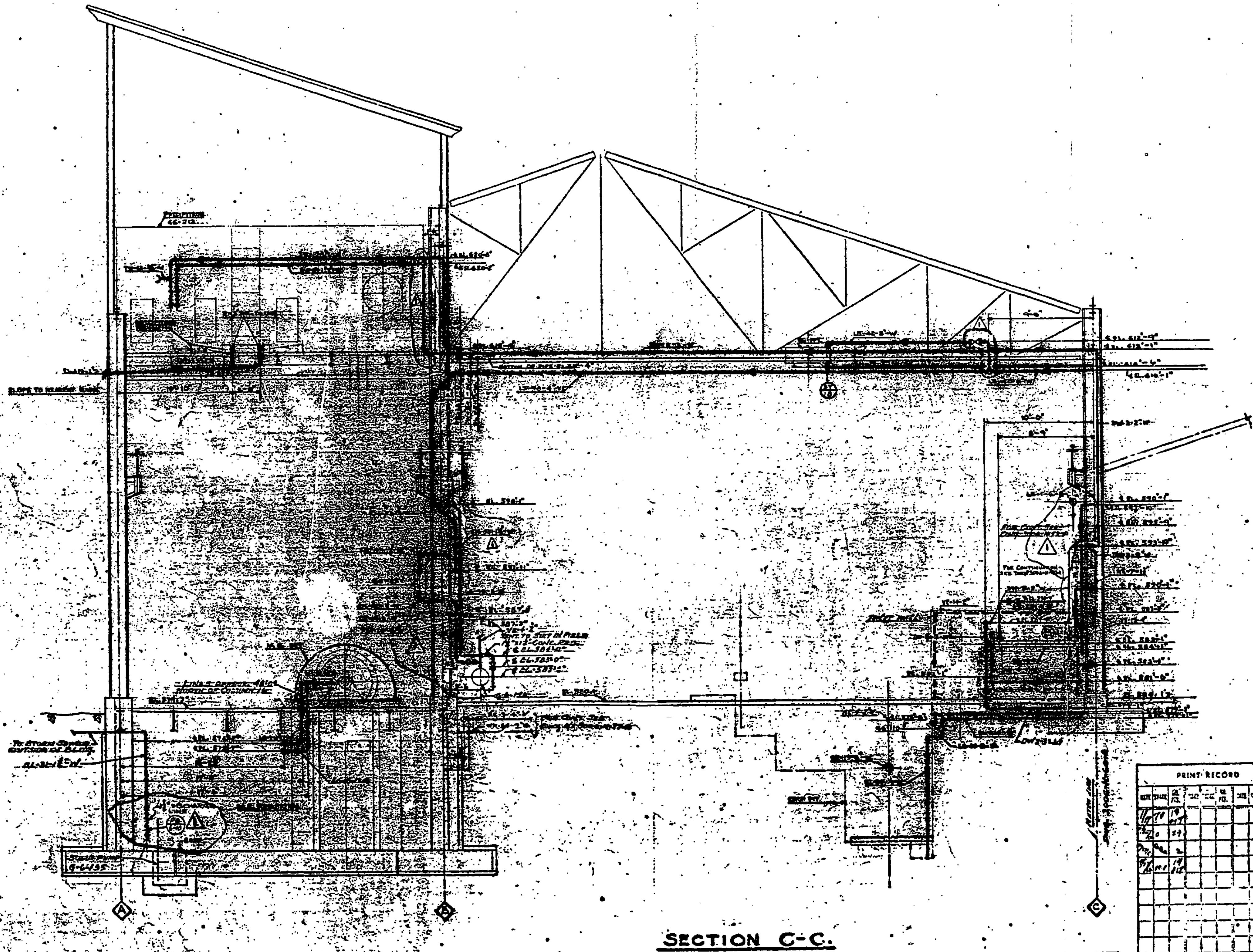
OFFICIAL U

[redacted]

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DRAWING NO. 3006-H-50-R.

2203

INFORMATION ONLY



SECTION C-C.

SCALE FOR THIS DRAWING

165

REV. NO.	DATE	DESCRIPTION	MADE BY	APP'D
1	6-16-52	RELOCATED G-6-176 AND REVISED CONNECTED PIPING. ADDED NOTE FOR LS-1. REVISED CN-33 FOR CONNECTION TO HEADER AT COL. B. RELOCATED SECTION OF PIPING DW-3 AT COL. B. ADDED PRESS. GAUGE IN DISCHARGE LINE FROM SUMP PUMP G-6-155 AT COL. A. REVISED LS-42.	CRAMER	

REVISIONS

APPROVED FOR A. E. C. BY

DATE

UNITED STATES ATOMIC ENERGY COMMISSION

NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1000

FEED MATERIAL PRODUCTION CENTER

FERNALD AREA

SECTION C-C

VIEW TAKEN BET. COLS. 15 & 16

DATE 2-25-52

SCALE 1/4" = 1 FT

DRAWN H. R. CULP

CHECKED T. L. EDWARDS, JR.

OFFICE OF CATALYTIC CONSTRUCTION CO. ... WALNUT STREET PHILA. 2, PA.

APPROVED FOR CONSTRUCTION

DRAWING NO. 3006-H-58-A

PRINT RECORD

INDEX CODE

06X	1450	P 00415

3006-H-59A

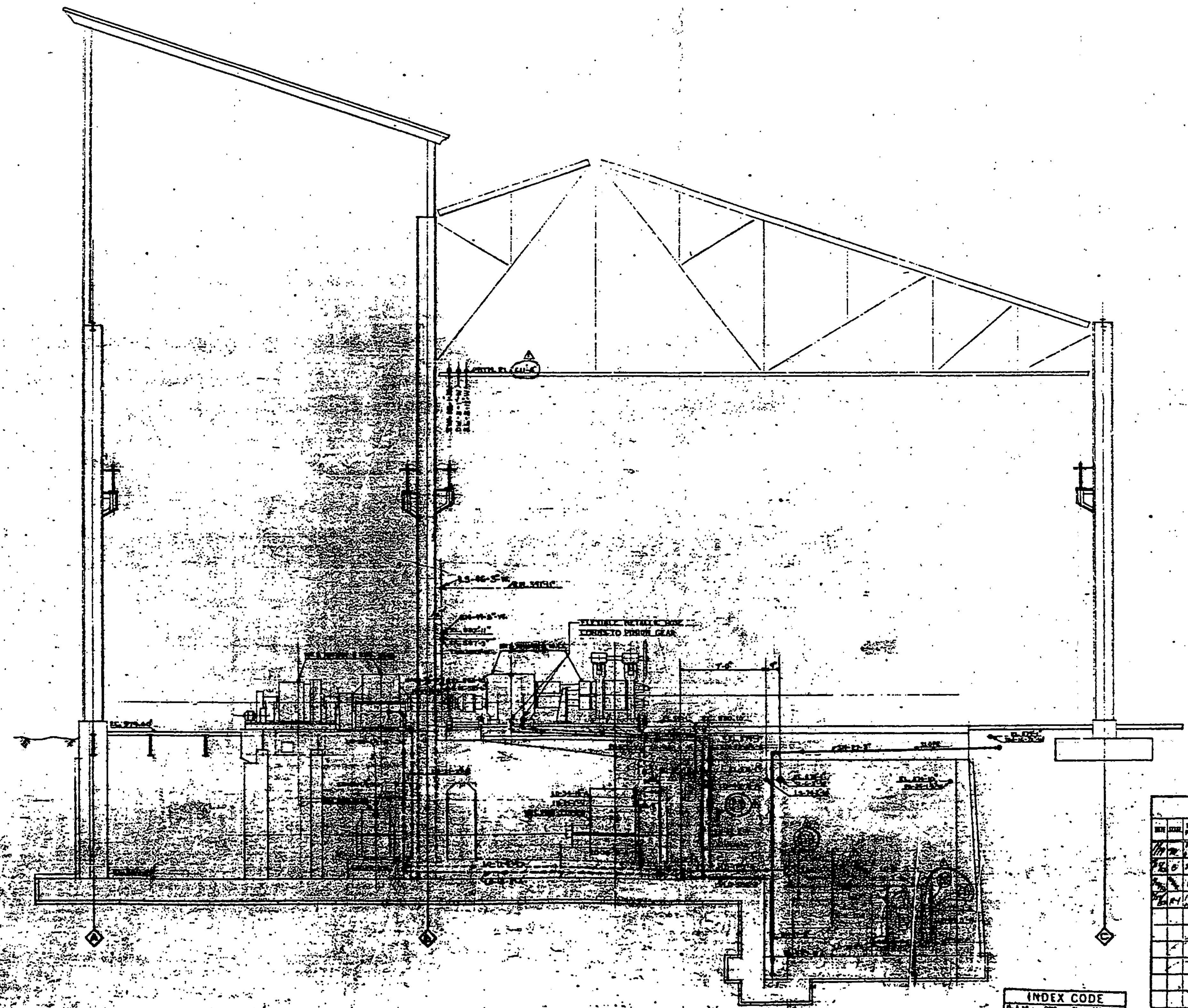
[redacted]

[redacted]

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DWG. # 3006-H-50-R

2203

INFORMATION ONLY



SCALE FOR THIS DRAWING

166

REV. NO.	DATE	DESCRIPTION	MADE BY	APP'D
5				
4				
3				
2				
1		ADDED ITEM NOS. FOR STRAINERS ... SYSTEM ... ADDED ... FOR ... BOTTOM OF PIPE ELEVATIONS FOR ...		

REVISIONS

APPROVED FOR A. E. C. BY

DATE

PRINT RECORD

UNITED STATES ATOMIC ENERGY COMMISSION

NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1000

FEED MATERIAL PRODUCTION CENTER

FERNALD AREA

SECTION E-E

VIEW TAKEN BET. COLS. 16 & 17

DATE 2-25-52

SCALE 1/4" = 1 FT.

DRAWN H. CULP

CHECKED A. ROBB

OFFICE OF CATALYTIC CONSTRUCTION CO. 1528 WALNUT STREET PHILA. 2, PA.

APPROVED FOR CONSTRUCTION

DRAWING NO. 3006-H-59-A

REVISION NO. 1

INDEX CODE

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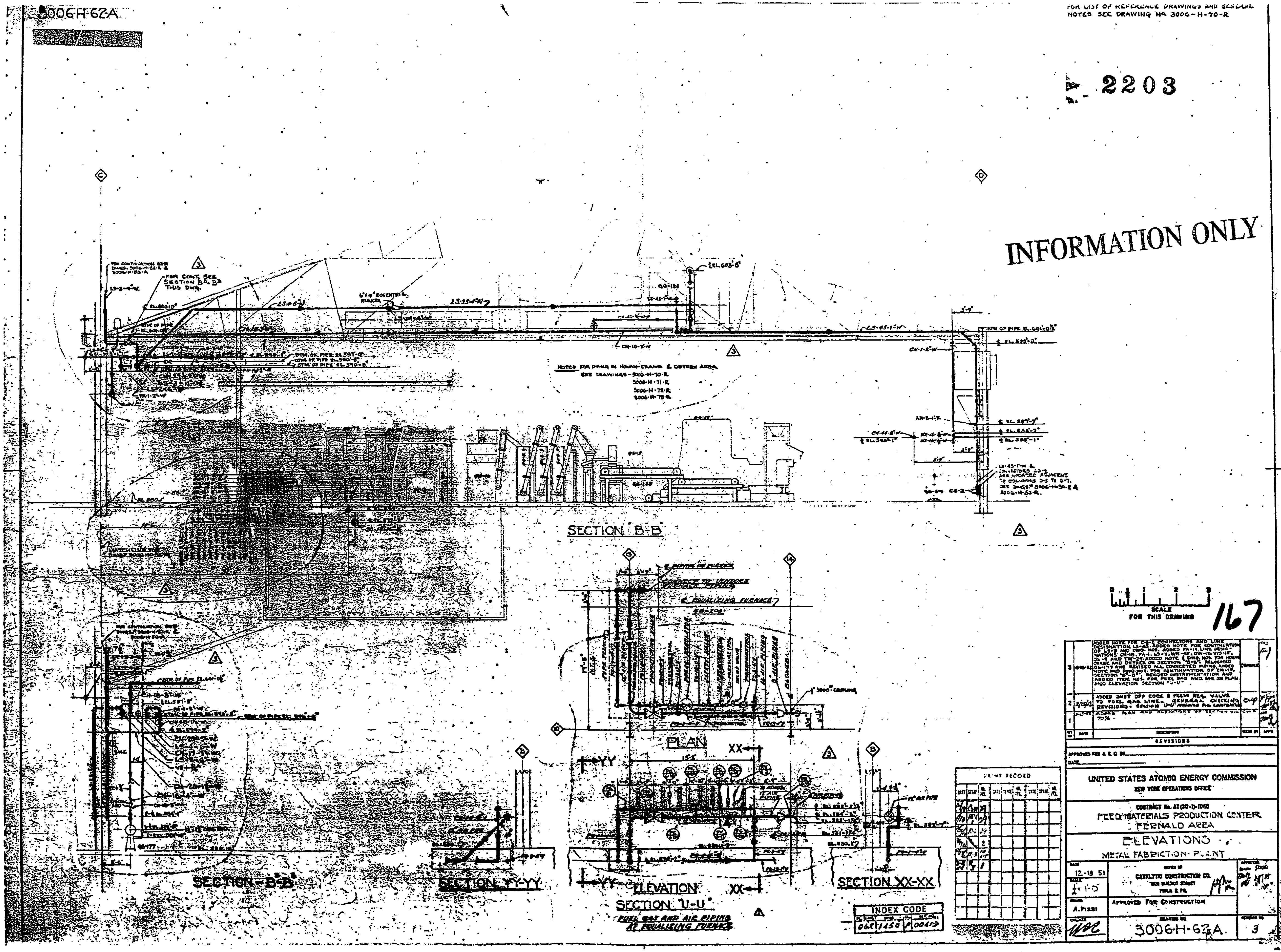
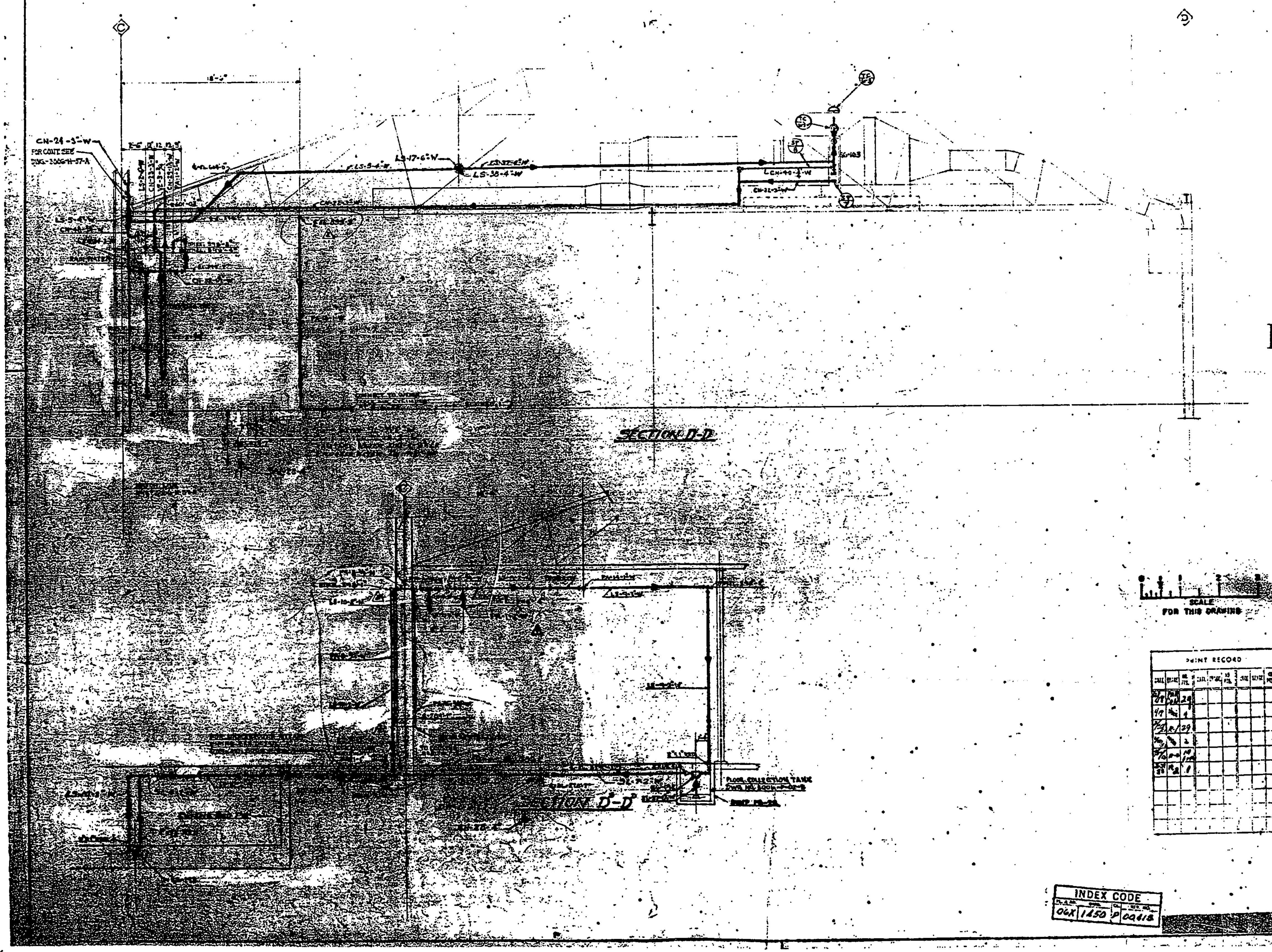

3006-H-62A
FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES SEE DRAWING NO. 3006-H-70-R
2203
INFORMATION ONLY
FOR CONT. SEE SECTION B²-B² THIS DWG.
LS-46-6"-W
LS-35-6"-W
6"x4" ECCENTRIC REDUCER
EL. 608'-8"
LS-45-1"-W
CN-18-3"-W
NOTE: FOR PIPING IN HONAN-CRANE & DETREX AREA SEE DRAWINGS - 3006-H-70-R, 3006-H-71-R, 3006-H-72-R, 3006-H-73-R.
LS-45-1"-W & CONNECTORS CG-2 ARE LOCATED ADJACENT TO COLUMNS D-5 TO D-7. SEE DWGS. 3006-H-50-R & 3006-H-53-R.
SECTION B-B
SECTION - B²-B²
PLAN
SECTION YY-YY
ELEVATION
SECTION "U-U"
FUEL GAS AND AIR PIPING AT EQUALIZING FURNACE
SECTION XX-XX
SCALE FOR THIS DRAWING
167
INDEX CODE
06R 1450 P 00419
PRINT RECORD
REVISIONS
APPROVED FOR A. E. C. BY
DATE
UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
CONTRACT No. AT(30-1)-1060
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA
ELEVATIONS
METAL FABRICATION PLANT
12-18-51
CATALYTIC CONSTRUCTION CO.
PHILA 2 PA.
A. PIZZI
APPROVED FOR CONSTRUCTION
3006-H-62A
3

3006-H-61-A

2203



INFORMATION ONLY

168

List of Reference Drawings & General Notes:
See Drawing - 3006-H-50-R

Rev. No.	Date	Description	Made by	App'd
5				
4				
3				
2	4-26-52	ADDED ℄ ELEVATION FOR PA-15. RELOCATED LS-10 ADDED LINE DESIGNATION PA-46 AND NOTES FOR CONNECTION OF SW-1 AND DW-9 TO AND FROM COOLING BED PULPIT.		
1	3-25-52	REVISED PIPING SECT. D'-D',		

REVISIONS

APPROVED FOR A. E. C. BY ____
DATE ____

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

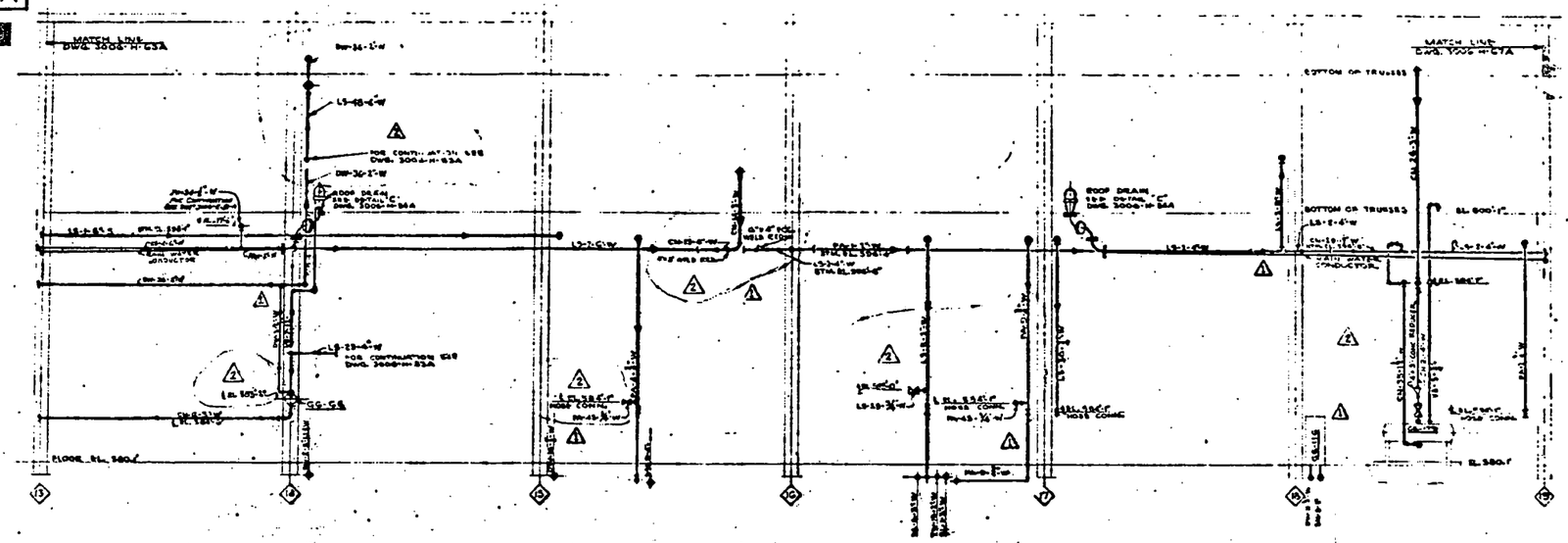
CONTRACT No. AT(30-1)-1068
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

ELEVATIONS
METALS FABRICATION PLANT

DATE 12-18-51
SCALE 1/8" = 1 FT
DRAWN J.A. PERZAN
OFFICE OF CATALYTIC CONSTRUCTION CO. 1528 WALNUT STREET, PHILA 2 PA
APPROVED FOR CONSTRUCTION
DRAWING NO. 3006-H-61-A

INDEX CODE
06X 1450 P 00418

3006-H-66-A



SECTION Y-Y

2203

FOR INFORMATION ONLY

169

FOR LIST OF REFERENCE DRAWINGS AND GENERAL NOTES, SEE DRAWING No. 3006-H-50-B

SCALE FOR THIS DRAWING

INDEX CODE
OLK 1450 P 00429

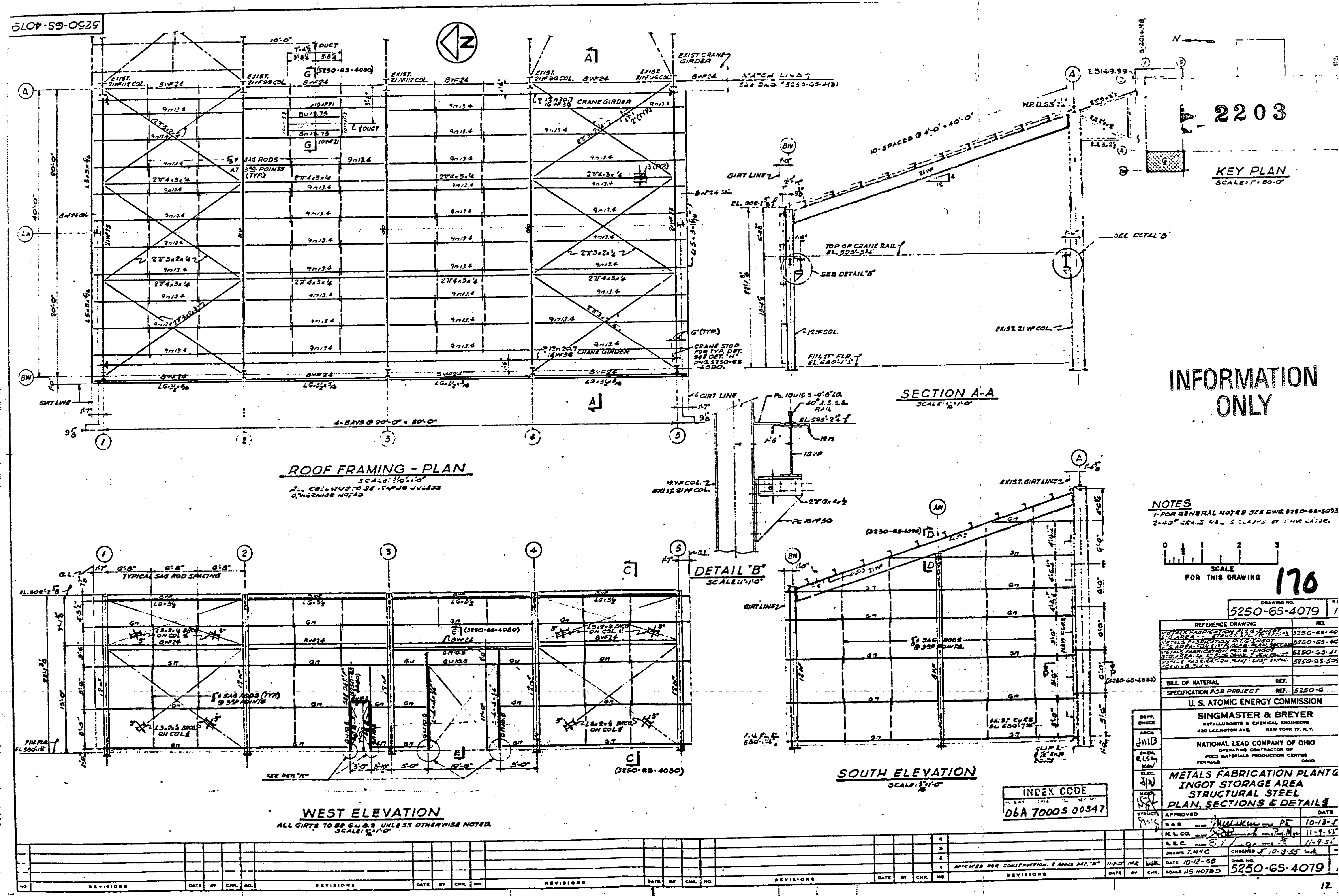
UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE

CONTRACT No. AT(30-1)-1040

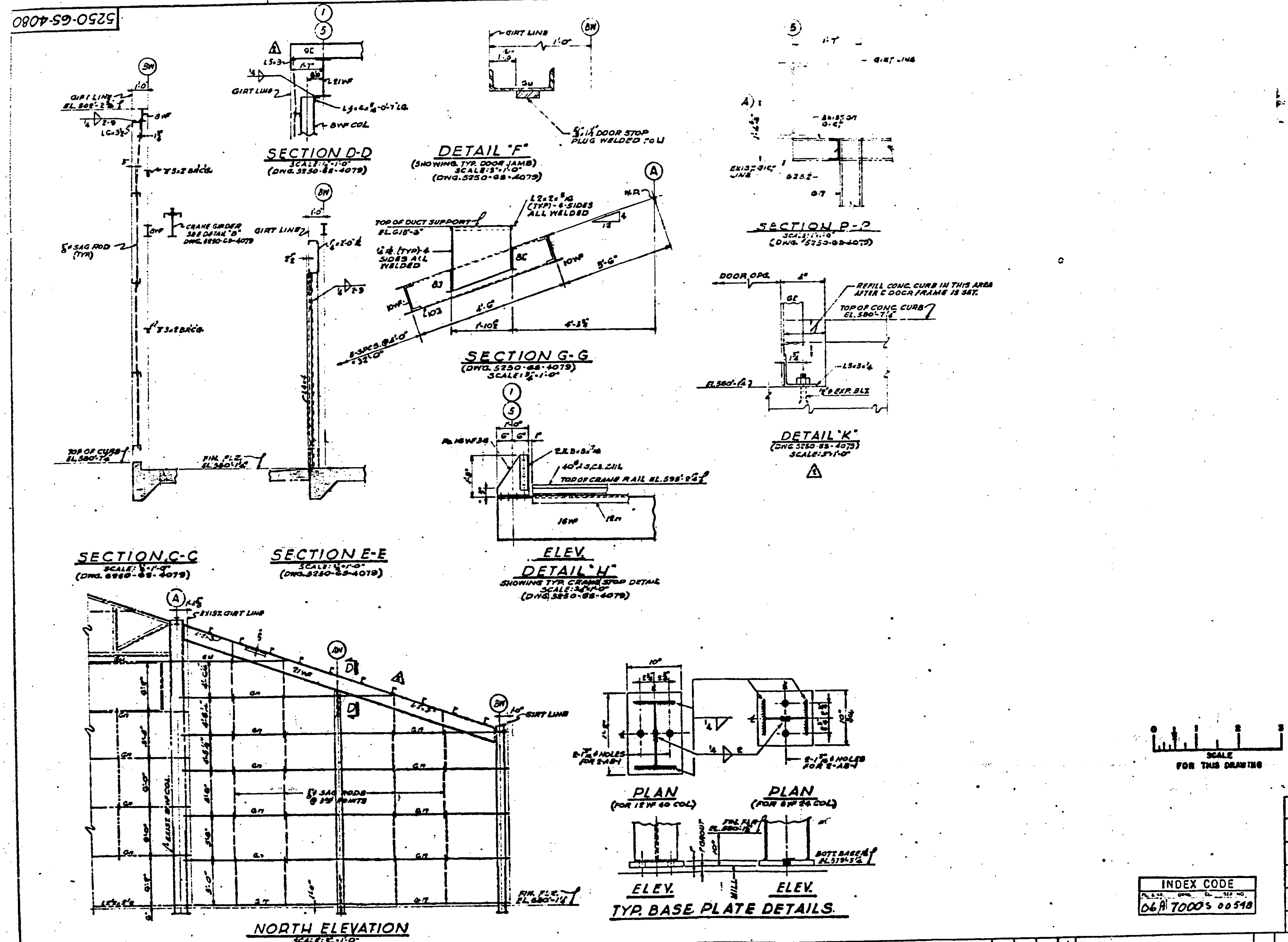
FEED MATERIAL PRODUCTION CENTER
FERNALD AREA

SECTIONAL ELEVATION
METALS FABRICATION PLANT

DATE 12-8-51	DRAWN BY CATALYTIC CONSTRUCTION CO. 1500 WALNUT STREET PHILA. 2, PA.	APPROVED
SCALE 3/8"=1'-0"	APPROVED FOR CONSTRUCTION	
DESIGNED	DRAWING NO. 3006-H-66-A.	REVISION NO. 2


5250-6S-4079
2203
KEY PLAN
SCALE: 1" = 80'-0"
INFORMATION ONLY
ROOF FRAMING - PLAN
4-BAYS @ 20'-0" = 80'-0"
SECTION A-A
10-SPACES @ 4'-0" = 40'-0"
TOP OF CRANE RAIL
SEE DETAIL "B"
EXIST. 21 WF COL.
DETAIL "B"
SCALE: 1" = 1'-0"
WEST ELEVATION
ALL GIRTS TO BE 6 U 8.2 UNLESS OTHERWISE NOTED.
TYPICAL SAG ROD SPACING
SOUTH ELEVATION
NOTES
1- FOR GENERAL NOTES SEE DWG. 5250-6S-5093
SCALE FOR THIS DRAWING
170
INDEX CODE
06A 7000S 00547
DRAWING NO. 5250-6S-4079
REFERENCE DRAWING
NO.
BILL OF MATERIAL
REF.
SPECIFICATION FOR PROJECT
REF. 5250-6
U. S. ATOMIC ENERGY COMMISSION
SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N. Y.
NATIONAL LEAD COMPANY OF OHIO
OPERATING CONTRACTOR OF
FEED MATERIALS PRODUCTION CENTER
FERNALD OHIO
METALS FABRICATION PLANT 6
INGOT STORAGE AREA
STRUCTURAL STEEL
PLAN, SECTIONS & DETAILS
APPROVED
DATE
S & B PE 10-13-55
N. L. CO. Proj. Mgr. 11-9-55
A. E. C. PE 11-9-55
DRAWN T. McC
CHECKED 10-3-55
DATE 10-12-55
SCALE AS NOTED
DWG. NO. 5250-6S-4079
APPROVED FOR CONSTRUCTION
REVISIONS
DATE
BY
CHK.
NO.

2203



INFORMATION ONLY

NOTE:
FOR GENERAL NOTES SEE DWG. 5250-6S-5093

171

INDEX CODE
06A 7000S 00548

NO.	REVISIONS	DATE	BY	CHK.
4				
3				
2	REVISED ROOF PURLINS. ADDED DET. "K"		T.E.C.	
1	APPROVED FOR CONSTRUCTION			

DRAWING NO. 5250-6S-4080

REFERENCE DRAWING	NO.
METALS FABRICATION PLANT 6 - INGOT STG. AREA - STRUCT. STL. PLAN, SECT. & DET.	5250-6S-40
METALS FABRICATION PLANT 6 - INGOT STG. AREA - FDN. PLAN, SECT. & DET.	5250-6S-40
BILL OF MATERIAL REF.	
SPECIFICATION FOR PROJECT REF.	5250-6

U. S. ATOMIC ENERGY COMMISSION

SINGMASTER & BREYER
METALLURGISTS & CHEMICAL ENGINEERS
420 LEXINGTON AVE. NEW YORK 17, N.Y.

NATIONAL LEAD COMPANY OF OHIO
OPERATING CONTRACTOR OF
FEED MATERIALS PRODUCTION CENTER
FERNALD OHIO

METALS FABRICATION PLANT 6
INGOT STORAGE AREA
STRUCTURAL STEEL
SECTIONS & DETAILS

APPROVED		DATE
S & B	NAME [signature] PE	10-13-5
N. L. CO.	NAME [signature] TITLE Proj. Mgr.	10-28-5
A. E. C.	NAME E H [signature] PM	10-27-5

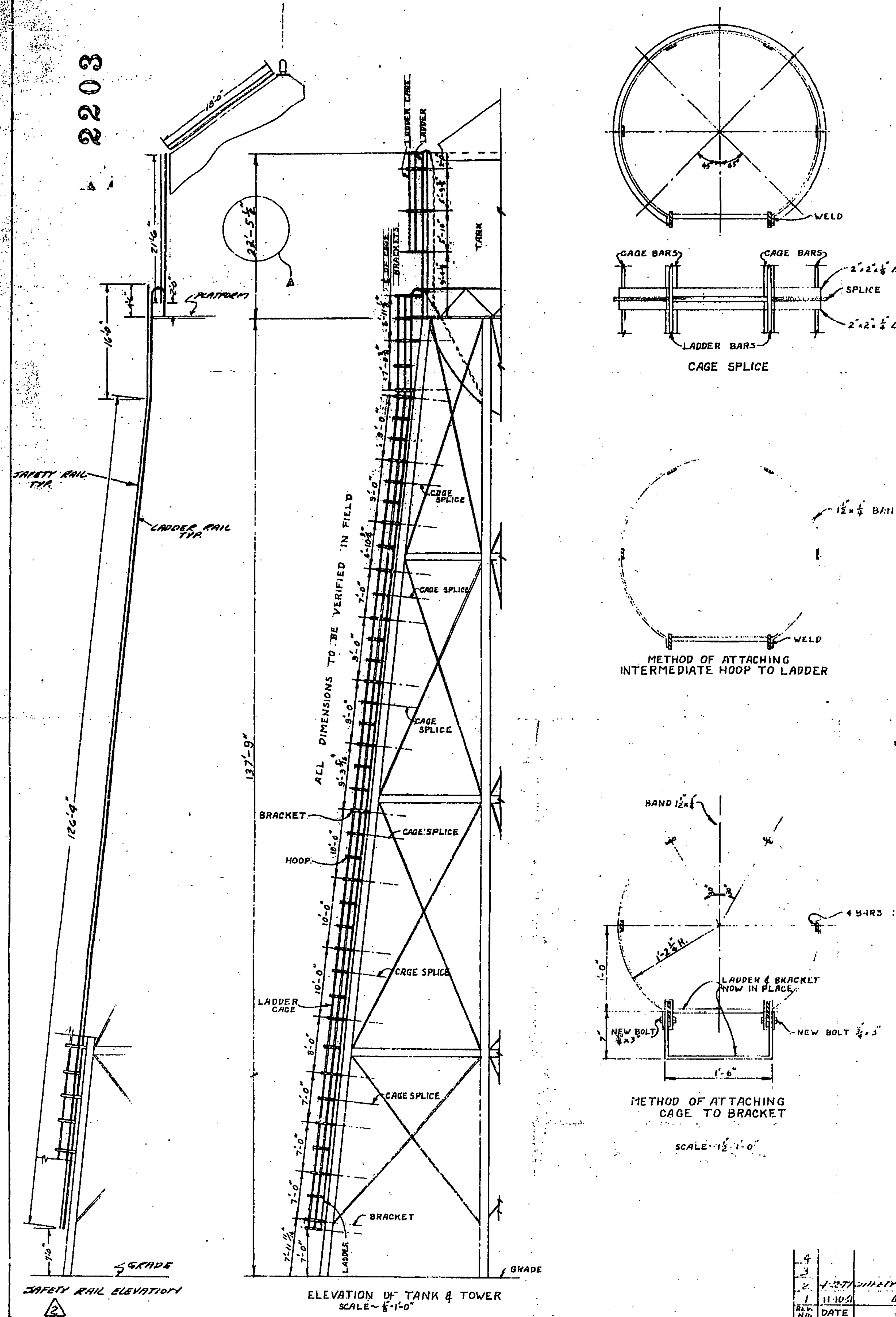
DRAWN T.MSC. CHECKED JT 10/13/55 WK
DATE 10-12-55
SCALE AS NOTED
DWG. NO. 5250-6S-4080

13

INFORMATION ONLY

172

2203



REV. NO.	DATE	DESCRIPTION	MADE BY
4			
3			
2	4-27	SAFETY RAIL ADDED	R.P.S.
1	11-10-51	A	C. "C" S.

REVISIONS

UNITED STATES ATOMIC ENERGY COMMISSION
NEW YORK OPERATIONS OFFICE
CONTRACT NO. AT (30-1)-1156
FEED MATERIALS PRODUCTION CENTER
FERNALD AREA

LADDER CAGE FOR TANK & TOWER

DATE 11-9-51 SCALE AS NOTED DRAWN C.C. SIPES CHECKED [illegible]	GEORGE A. FULLER CO CINCINNATI, OHIO STEEL DRAWING NO. 3008-C-GAF #6-B	APPROVED FOR A. E. C. REV. NO. 2

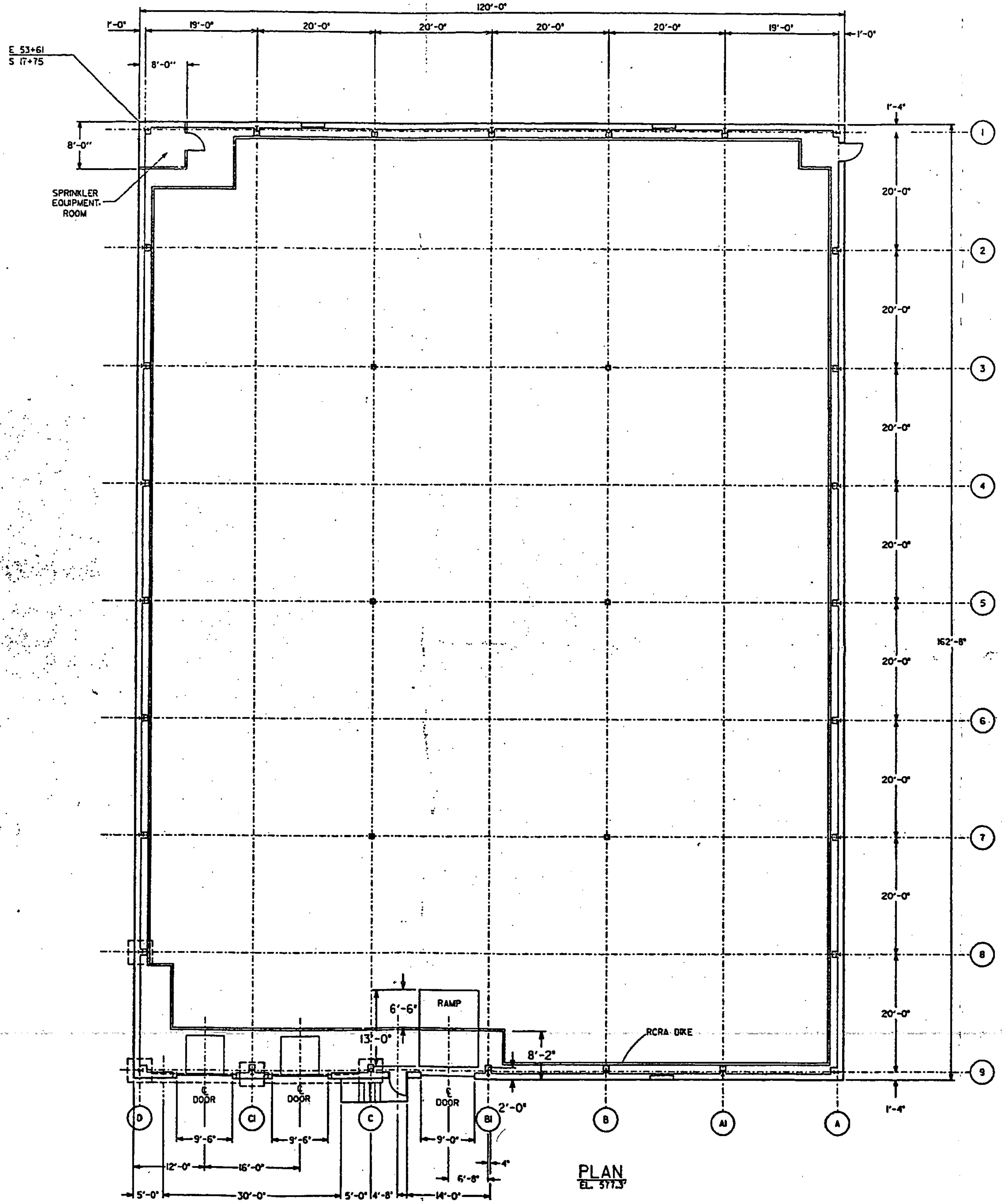
INDEX CODE

PL. & AR.	ORIG.	CL.	SER. NO.
20D	3115	S	00168

APPROVED BY
CATALYTIC CONSTRUCTION CO.
NOV. 9, 1951

2203

INFORMATION ONLY



PLAN
EL. 577.3'

173

NOTE:
1. FOR RCRA DETAILS ON THIS WAREHOUSE SEE RESTAB DIRECTORY.

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED/RCRA DIKES ADDED	9/23/91		GP

REF. DWG. NO.: 77X-5500-A-00004

NOTE: WEMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

APPROVALS

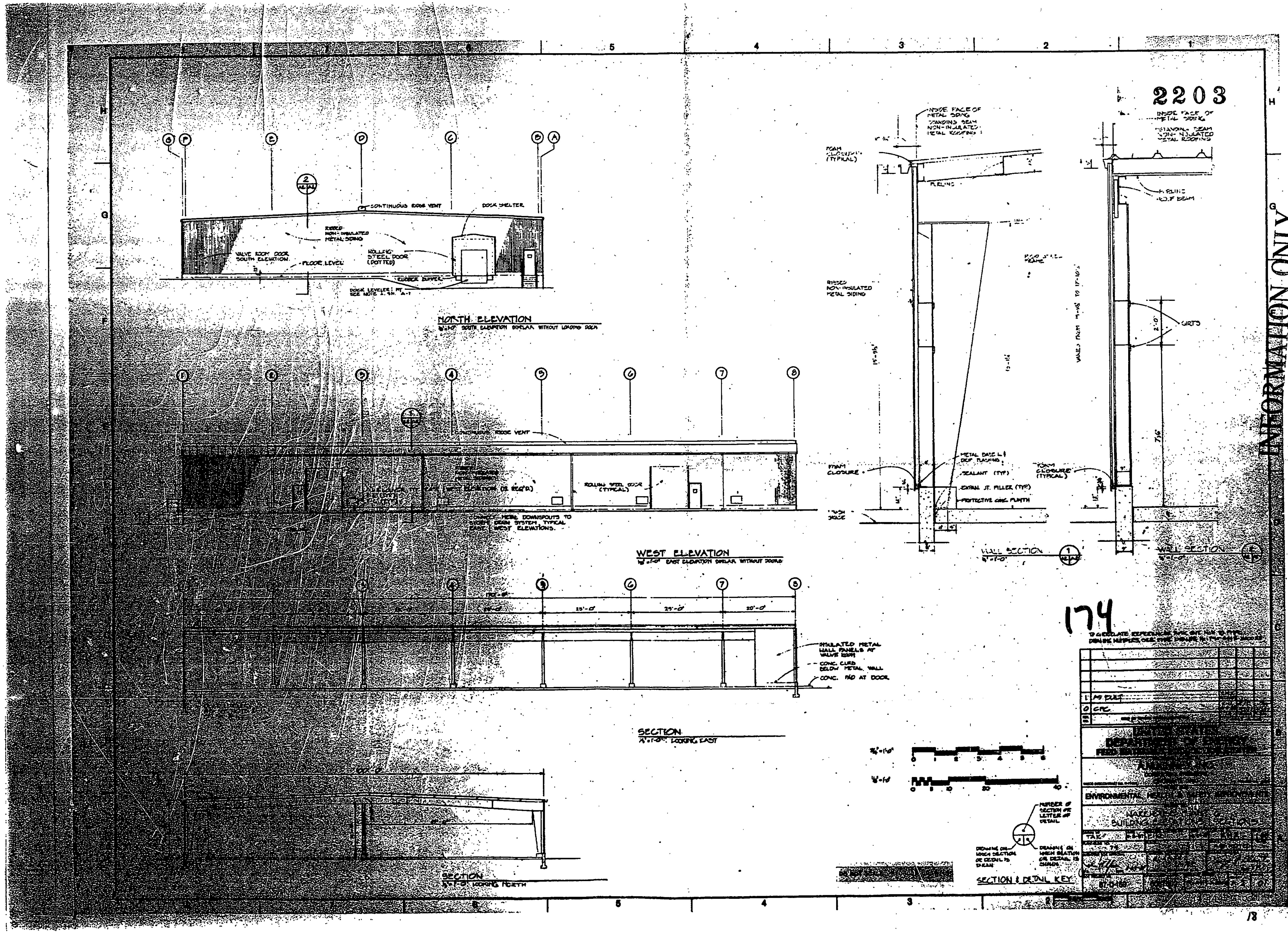
CIVIL & STR.			SAFETY ENG.	
ELECTRICAL			MAINTENANCE	
ENGINEER			Q.A.	
INSTRUMENT				
MECHANICAL			FIRE PROTECT.	
			WASTE MANAGE.	
CHECKED			D.O.E.	
APPROVED	GEP		SECURITY	

WESTINGHOUSE ENVIRONMENTAL MANAGEMENT CO. OF OHIO
FERNALD, OHIO
FERNALD ENVIRONMENTAL MANAGEMENT PROJECT
U.S. DEPARTMENT OF ENERGY

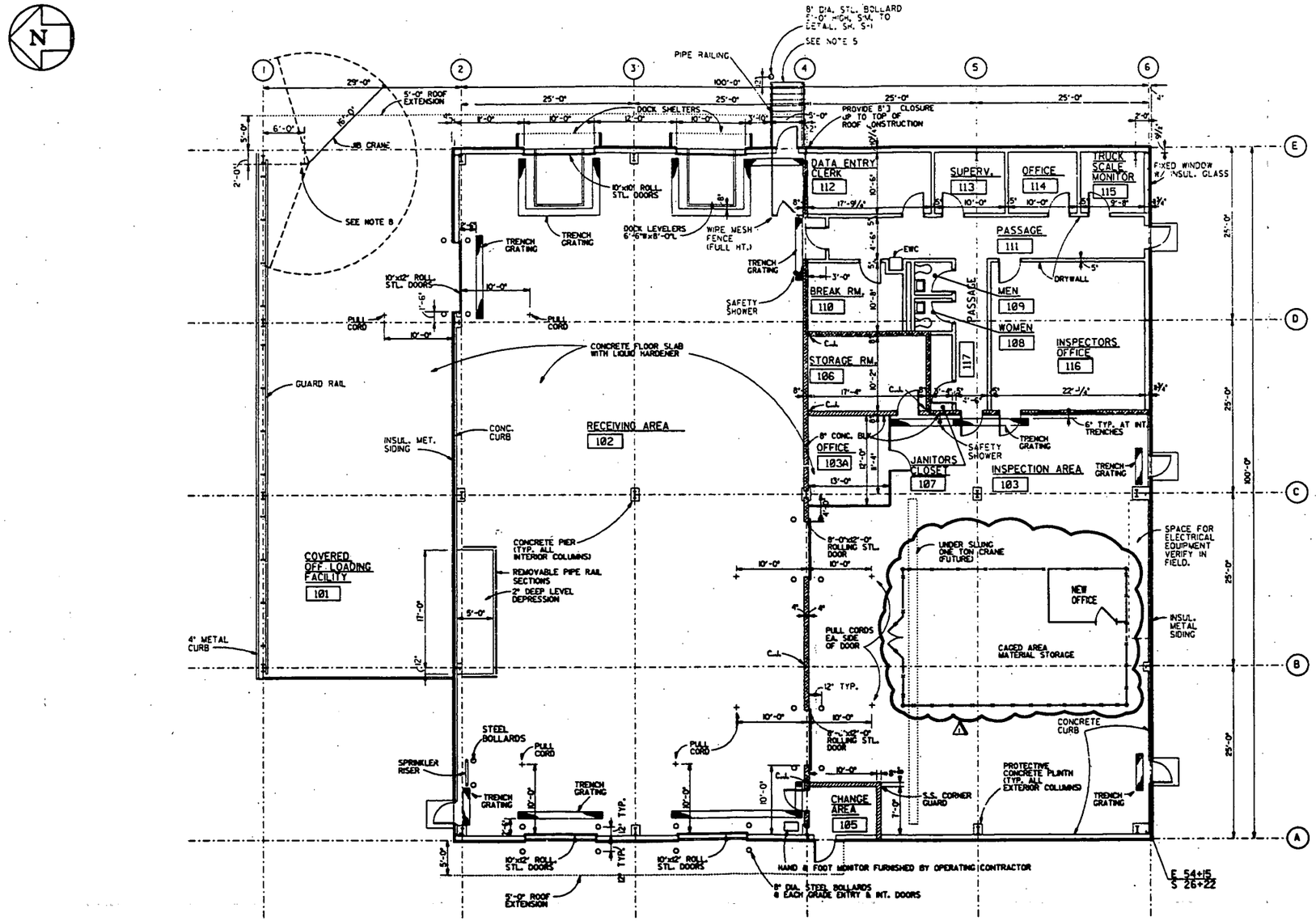
BUILDING 77 — FIRST FLOOR
FINISHED PRODUCTS WAREHOUSE
FLOOR PLAN
1/8" = 1'-0"

77X-5500-A-00011 | 1

FILE NAME: /FLOOR/77.DGN


2203
INFORMATION ONLY
174
CONTINUOUS RIDGE VENT
DOCK SHELTER
RIBBED NON-INSULATED METAL SIDING
VALVE ROOM DOOR SOUTH ELEVATION
FLOOR LEVEL
ROLLING STEEL DOOR (POTTED)
RUBBER BUMPER
NORTH ELEVATION
ROLLING STEEL DOOR (TYPICAL)
WEST ELEVATION
SECTION
SECTION
WALL SECTION
WALL SECTION
INSIDE FACE OF METAL SIDING
STANDING SEAM NON-INSULATED METAL ROOFING
FOAM CLOSURE (TYPICAL)
PURLINS
RIBBED NON-INSULATED METAL SIDING
GIRTS
METAL BASE L & DRIP FLASHING
SEALANT (TYP)
EXPAN. JT. FILLER (TYP)
PROTECTIVE CONC. PLINTH
FOAM CLOSURE
FOAM CLOSURE (TYPICAL)
25'-0"
25'-0"
20'-0"
INSULATED METAL WALL PANELS AT VALVE ROOM
CONC. CURB BELOW METAL WALL
CONC. PAD AT DOOR
NUMBER OF SECTION OR LETTER OF DETAIL
SECTION & DETAIL KEY
ENVIRONMENTAL
18

2203



KEY TO MATERIALS

- CONCRETE BLOCK WITH INSULATION
- CONCRETE BLOCK WITHOUT INSULATION
- GYPSUM DRYWALL PARTITION
- METAL CAGING

GENERAL NOTES:

1. PRE-ENGINEERED BUILDING DESIGN, AS SHOWN, INCLUDING COLUMN LINES AND OVERALL BUILDING DIMENSIONS, MAY VARY FROM THOSE SHOWN FOR OTHER ACCEPTABLE PRE-ENGINEERED BUILDING SYSTEMS, SUBJECT TO CLIENT APPROVAL. MINIMUM CLEAR INTERIOR AND EXTERIOR HEIGHTS MUST BE PROVIDED.
2. DIMENSIONS OF DOCK LEVELERS AND RELATED CONCRETE PITS, AS SHOWN, MAY VARY FROM THOSE SHOWN FOR OTHER ACCEPTABLE DOCK LEVELER SYSTEMS. DOCK LEVELER PIT AND RELATED COMPONENTS MUST BE CONSTRUCTED FROM APPROVED DOCK LEVELER SHOP DRAWINGS.
3. STEEL FRAMING FOR ALL EXTERIOR DOOR, WINDOW AND LOUVER OPENINGS TO BE PROVIDED BY MANUFACTURER OF PRE-ENGINEERED BUILDING.
4. LOUVERS TO BE FIXED EXTRUDED ALUMINUM, WITH BIRD SCREEN.
5. CONCRETE STEPS AT TRUCK DOCK TO HAVE CAST ALUMINUM ABRASIVE NOSINGS.
6. METAL ROOFING AND SIDING TO BE INSULATED, EXCEPT ROOFING OVER COVERED OFF-LOADING FACILITY 101.
7. LOCATION AND OPENING DIMENSIONS OF MECHANICAL EQUIPMENT TO BE COORDINATED WITH STEEL FRAMING OF PRE-ENGINEERED BUILDING, AND WITH MECH. EQUIP. APPROVED SHOP DRAWINGS.
8. STEEL STRUCTURE OF PREFABRICATED METAL BUILDING MUST BE DESIGNED TO SUPPORT THE JIB CRANE, THE FUTURE BRIDGE CRANE, ROOF FANS, AIR CONDITIONING UNITS WITH RELATED WORK PLATFORMS, ASSOCIATED DUCTWORK AND PIPING, IN ADDITION TO DESIGN CRITERIA LISTED IN SPECIFICATIONS.

INFORMATION ONLY

175

NOTE: ORIGINAL DRAWING IN /AMR/BLDG82/R1MA0A10L001

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	ADDED CAGED AREA AND OFFICE PER RES 3543	1/3/98	LRD	GEP

NO.	REVISIONS	DATE	DWN. BY	APPD.	REF. DWG. NO.

NOTE: FERMCO C.A.D. DRAWING NOT TO BE REVISED MANUALLY

PERFORMANCE GRADE 1 2 3 4 5

BY: DATED:

APPROVALS			
CIVIL & STR.		SAFETY ENG.	
ELECTRICAL		MAINTENANCE	
ENGINEER		Q.A.	
INSTRUMENT		FIRE PROTECT.	
MECHANICAL		WASTE MANAGE	
		SECURITY	
		CRU	
CHECKED	GEP		
APPROVED	C.E. PAUL		

FERNALD ENVIRONMENTAL RESTORATION MANAGEMENT CORPORATION
Fernald Environmental Management Project
U.S. DEPARTMENT OF ENERGY

BUILDING 82
RECEIVING/INCOMING MAT'L INSPECTION
FLOOR PLAN
1/8" = 1'-0"

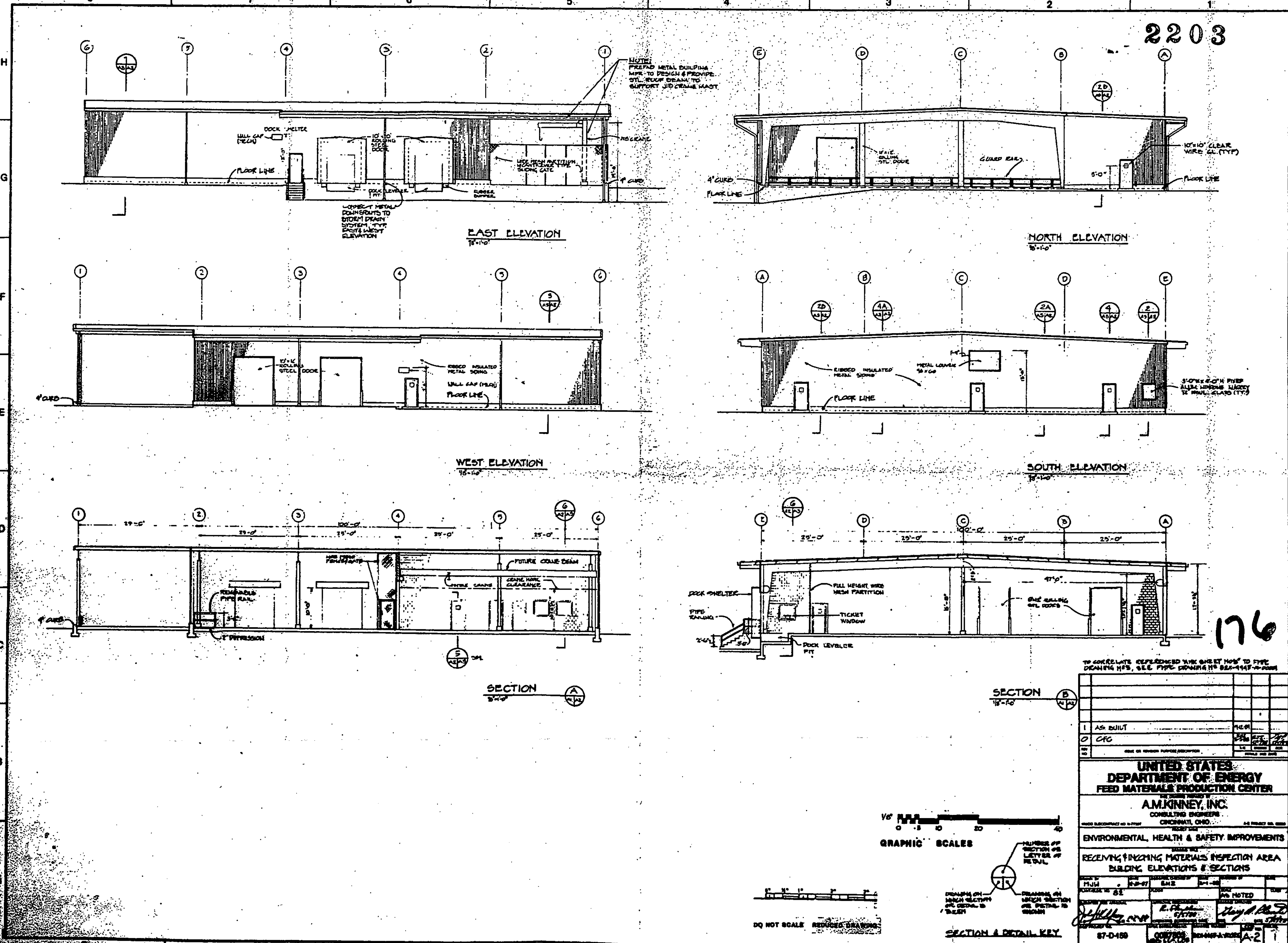
DATE 3/2/98
DRAWN S.A.SHOCK

82X-5500-A-00078 | 1

FILE NAME: /FLOOR/82.DGN

FORMAT REVISED 8/7/95

R82.m(453.cadd1) paul7461@cadd1. Wed Aug 5 12:43:32 EDT 1998



APPENDIX E

2203

PHOTOGRAPHS

D

An extensive array of photographs was compiled for the Plant 6/EW Complex D&D project along with three reference drawings showing relative positioning of the camera angle. The individual photographs are identified by Photograph No., Negative No., and Process/Location (exterior or interior) in the tables shown on the left side of Drawing Nos. 06X-5500-X-08260 (Plant 6 photo locations), 082-5500-X-00087 (East Warehouse Complex photo locations), and 63X-5500-X-00037 (KC-2 Warehouse photo locations).

R

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D

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F

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178

2203

PHOTO GRAPH NO.	NEGATIVE NO.	PROCESS / LOCATION	PAGE NO.
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2	6840-117	EXTERIOR	
3	6840-111	EXTERIOR	
4	6840-110	EXTERIOR	
5	6840-108	EXTERIOR	
6	6840-130	EXTERIOR	
7	6840-131	EXTERIOR	
8	6840-129	EXTERIOR	
9	6840-128	EXTERIOR	
10	6840-127	EXTERIOR	
11	6840-126	EXTERIOR	
12	6840-125	EXTERIOR	
13	6840-121	EXTERIOR	
14	6840-124	INTERIOR	
15	6840-1	INTERIOR	
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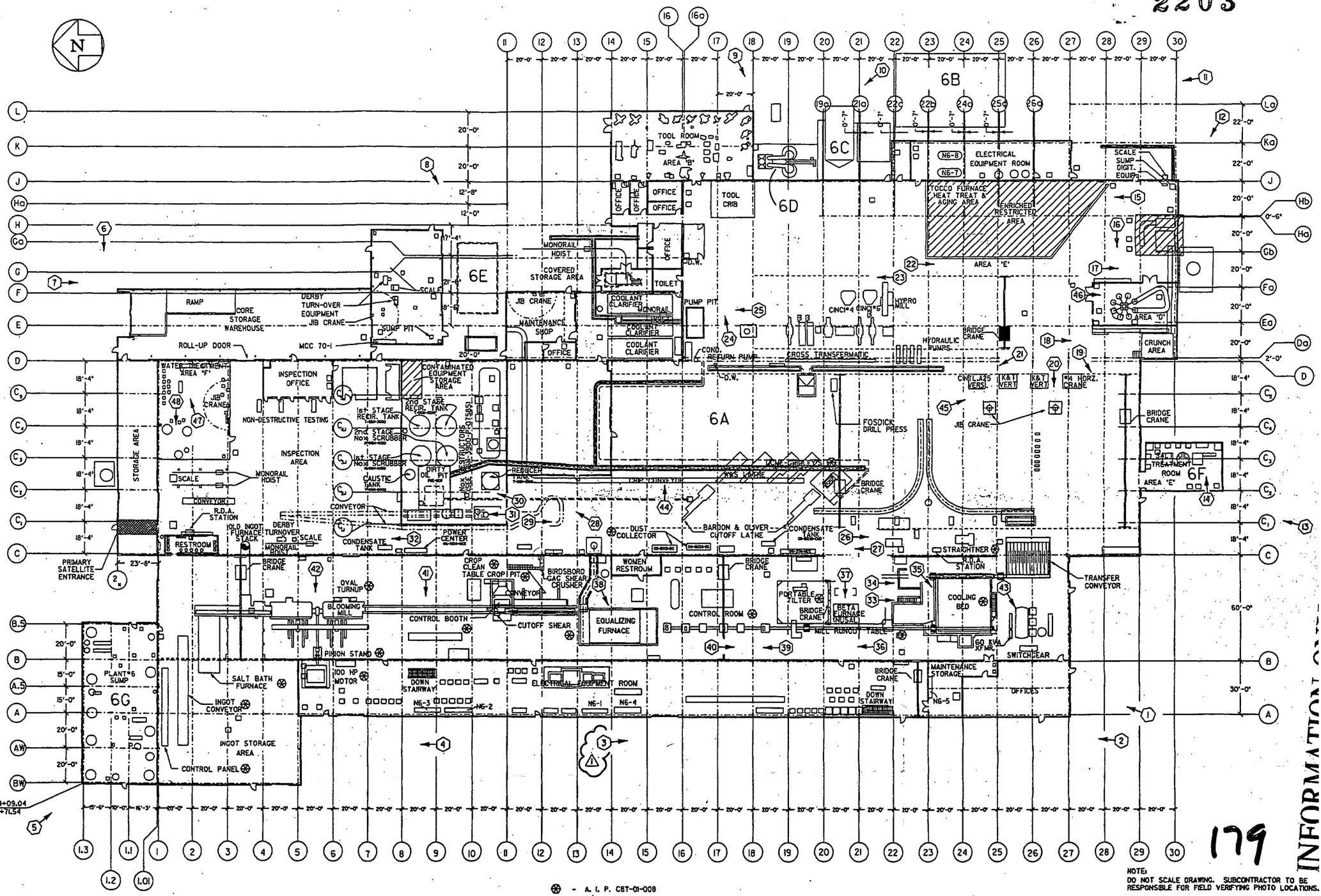
35	6460-7	INTERIOR	
36	6460-11	INTERIOR	
37	6460-14	INTERIOR	
38	6460-16	INTERIOR	
39	6460-19	INTERIOR	
40	6460-23	INTERIOR	
41	6460-33	INTERIOR	
42	6460-51	INTERIOR	
43	6460-63	INTERIOR	
44	6460-93	INTERIOR	
45	6460-108	INTERIOR	
46	6460-125	INTERIOR	
47	6460-178	INTERIOR	
48	6460-187	INTERIOR	



⊗ - A. I. P. C8T-01-008

179

NOTE:
DO NOT SCALE DRAWING. SUBCONTRACTOR TO BE RESPONSIBLE FOR FIELD VERIFYING PHOTO LOCATIONS.

INFORMATION ONLY

NO.	REVISIONS	DATE	DWN. BY	APPD.
1	UPDATED	1/29/98	SJS	
0	CFC	4/1/98	SJS	

REF. DWG. NO.

NOTE:
FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING — YES / NO

SYSTEMS, STRUCTURES OR COMPONENTS AFFECTED BY THIS DRAWING ARE UNDER CONFIGURATION MANAGEMENT CONTROL. SEE NOTES.

COGNIZANT ENGINEER — DATE

APPROVALS			
CIVIL & STR.			SAFETY ENG.
ELECTRICAL			MAINTENANCE
ENGINEER	J.R. FRY	4/1/98	FIRE PROTECT.
INSTRUMENT			WASTE MANAGE.
MECHANICAL			SECURITY
CHECKED	G.P.		CRU
APPROVED	G.E. PAUL	4/1/98	

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

PLANT 6A — FIRST

METALS FABRICATION PLAN
PHOTO LOCATIONS

RES #3526
DATE 3/25/98
DRAWN S.J.SMOCK

06X-5500-X-0826

FILE NAME: [illegible]

FORMAT REVISED 8/5/96 · FDF-4.DGN

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3	6940-17	INTERIOR	2
4	6940-15	INTERIOR	2
5	6970-05	EXTERIOR	3
6	6970-02	EXTERIOR	3
7	6940-26	EXTERIOR	4
8	6940-24	EXTERIOR	4
9	6940-6	INTERIOR	5
10	6940-8	INTERIOR	5
11	6940-29	EXTERIOR	6
12	6940-28	EXTERIOR	6
13	6940-31	INTERIOR	7
14	6940-36	INTERIOR	7
15	6940-3	EXTERIOR	8
16	6940-1	EXTERIOR	9
17	6940-2	EXTERIOR	9
18	6940-19	EXTERIOR	10
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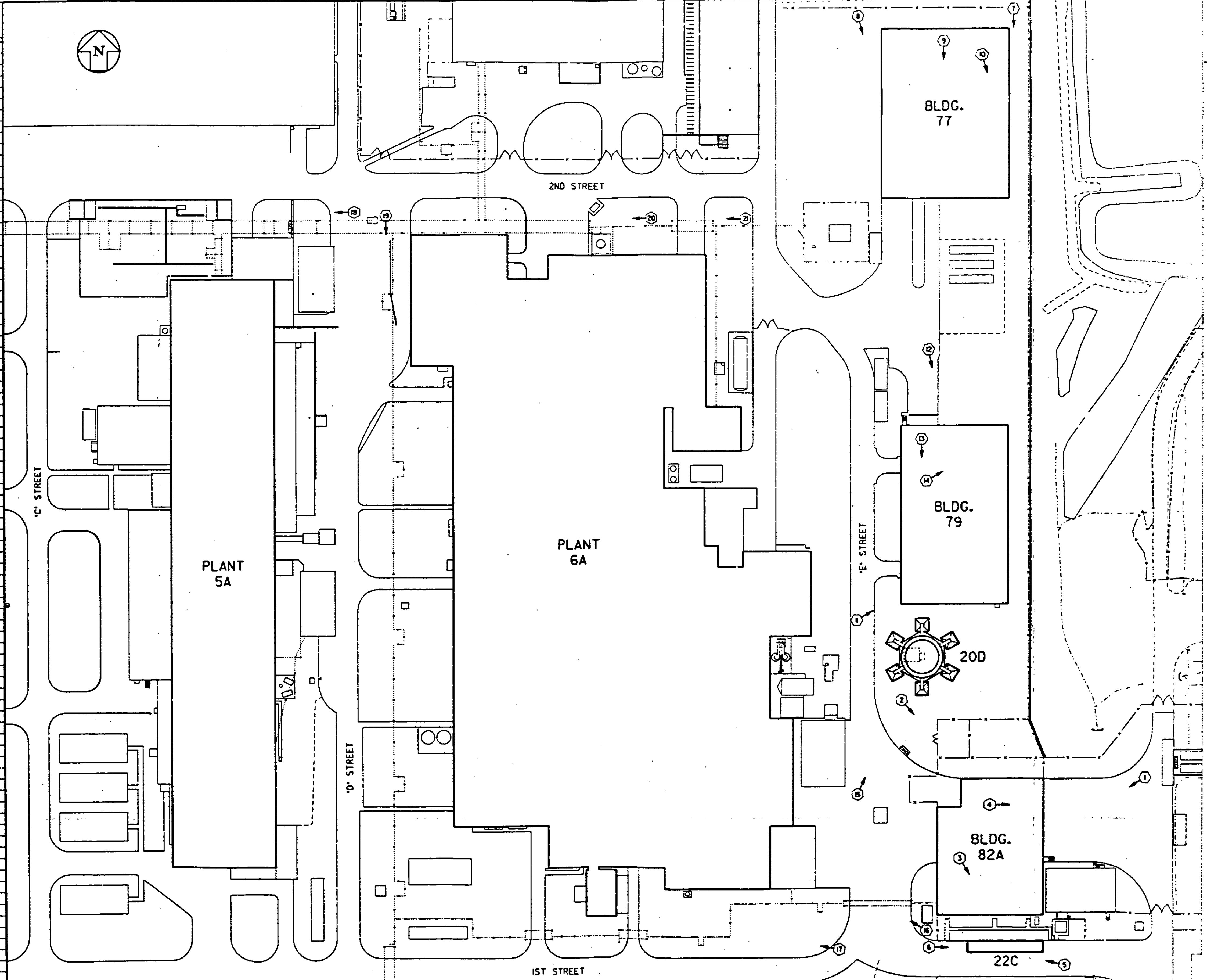
21	6940-22	EXTERIOR	8



2203

INFORMATION ONLY

180

NOTE:
DO NOT SCALE DRAWING. SUBCONTRACTOR TO BE RESPONSIBLE FOR FIELD VERIFYING PHOTO LOCATIONS.

NO.	REVISIONS	DATE	DWN. BY	APPO.	NO.	REVISIONS	DATE	DWN. BY	APPO.	REF. DWG. NO.
					0	ISSUE CFC		SJS		

NOTE: FLUOR DANIEL FERNALD CADD DRAWING. DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

APPROVALS: CIVIL & STR. / ELECTRICAL / ENGINEER / INSTRUMENT / MECHANICAL / CHECKED / APPROVED / SAFETY ENG. / MAINTENANCE / FIRE PROTECT. / WASTE MANAGE. / SECURITY / CRU

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

5A, 6A, 20D, 22C, 77, 79, 82A
WAREHOUSE COMPLEXES
PHOTO LOCATIONS
SCALE: NONE

82X-5500-X-00087 | 0

FILE NAME:

2203

PHOTOGRAPH NO.	NEGATIVE NO.	PROCESS / LOCATION	PAGE NO.
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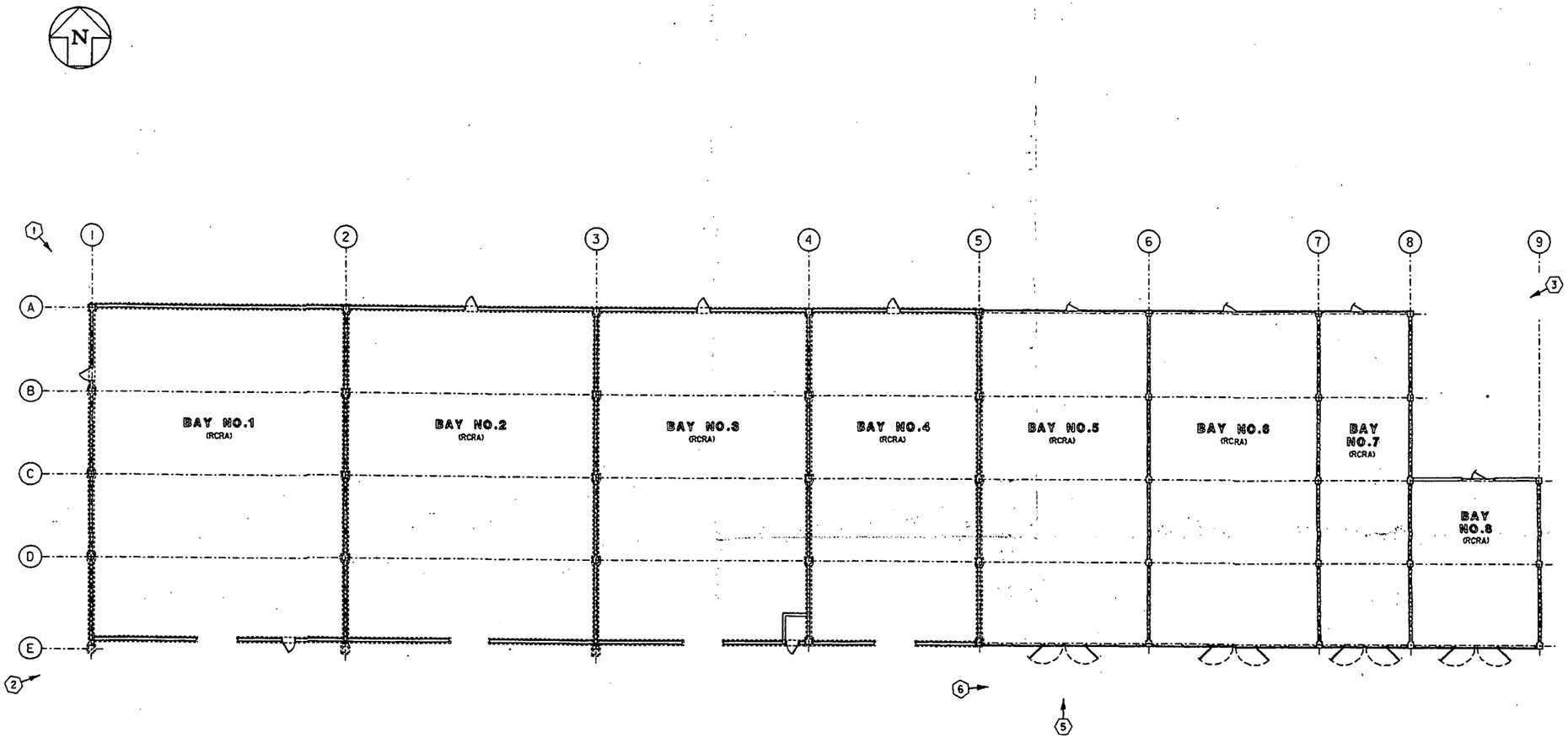
3	7036-9		
4	7036-8		
5	7036-7		
6	7036-4		



INFORMATION ONLY

ECDC CONTROLLED COPY NO.

8346

EC... NO.

181

NOTE:
DO NOT SCALE DRAWING. SUBCONTRACTOR TO BE RESPONSIBLE FOR FIELD VERIFYING PHOTO LOCATIONS.

NO.	REVISIONS	DATE	DWN. BY	APPD.
0	ISSUE CFC	1/5/98	SJS	[illegible]

NO.	REVISIONS	DATE	DWN. BY	APPD.

REF. DWG. NO.

NOTE: FLUOR DANIEL FERNALD CADD DRAWING, DO NOT REVISE MANUALLY.

CONFIGURATION MANAGEMENT DRAWING

YES / NO

EXISTING STRUCTURES OR COMPONENTS AFFECTED BY THIS DRAWING ARE LISTED ON CONFIGURATION MANAGEMENT CONTROL SEE NOTES.

COGNIZANT ENGINEER DATE

APPROVALS					
			SAFETY ENG.		
CIVIL & STR.			MAINTENANCE		
ELECTRICAL			FIRE PROTECT.		
ENGINEER	J.R. Fitt	1/5/98	WASTE MANAGE		
INSTRUMENT			SECURITY		
MECHANICAL			CRU		
CHECKED	[illegible]				
APPROVED	[illegible]	1/5/98			

Fernald Environmental Management Project

FLUOR DANIEL FERNALD

U.S. DEPARTMENT OF ENERGY

BLDG. 63

KC-2 WAREHOUSE PHOTO LOCATIONS

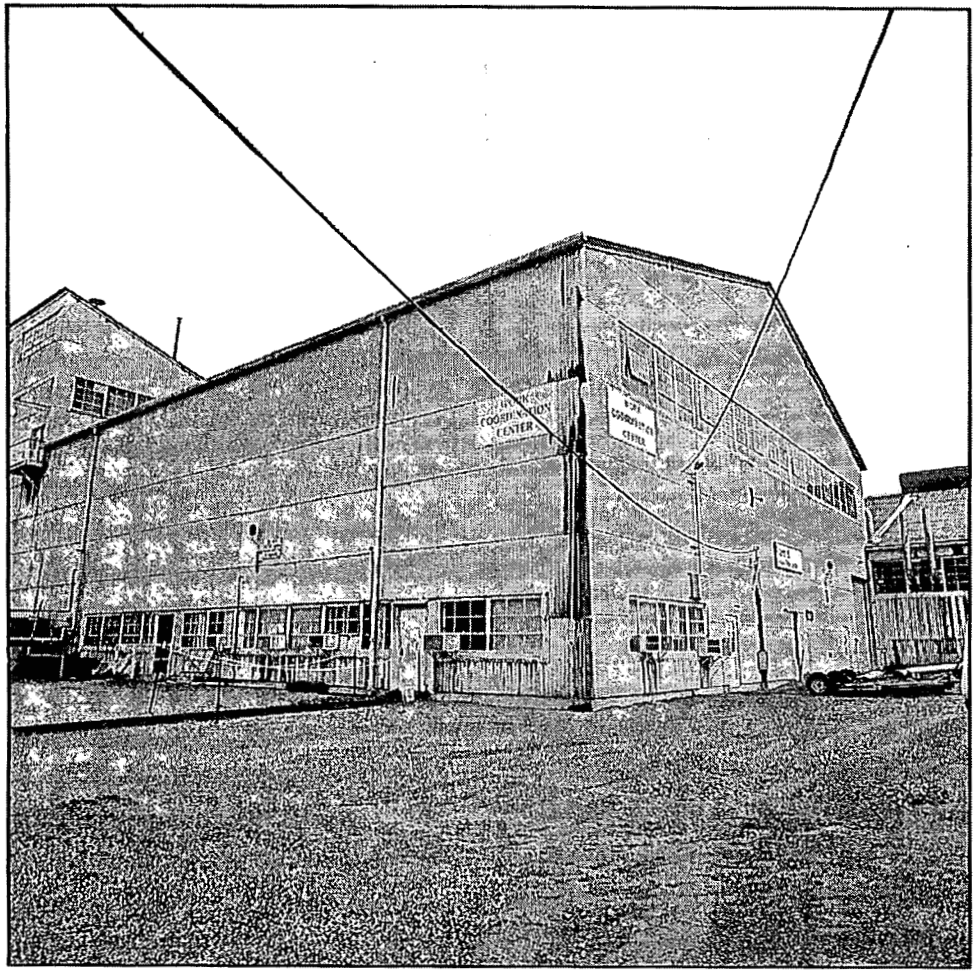
SCALE: NONE

RES. #3806
DATE 1/18/99
DRAWN S.J.SMOCK

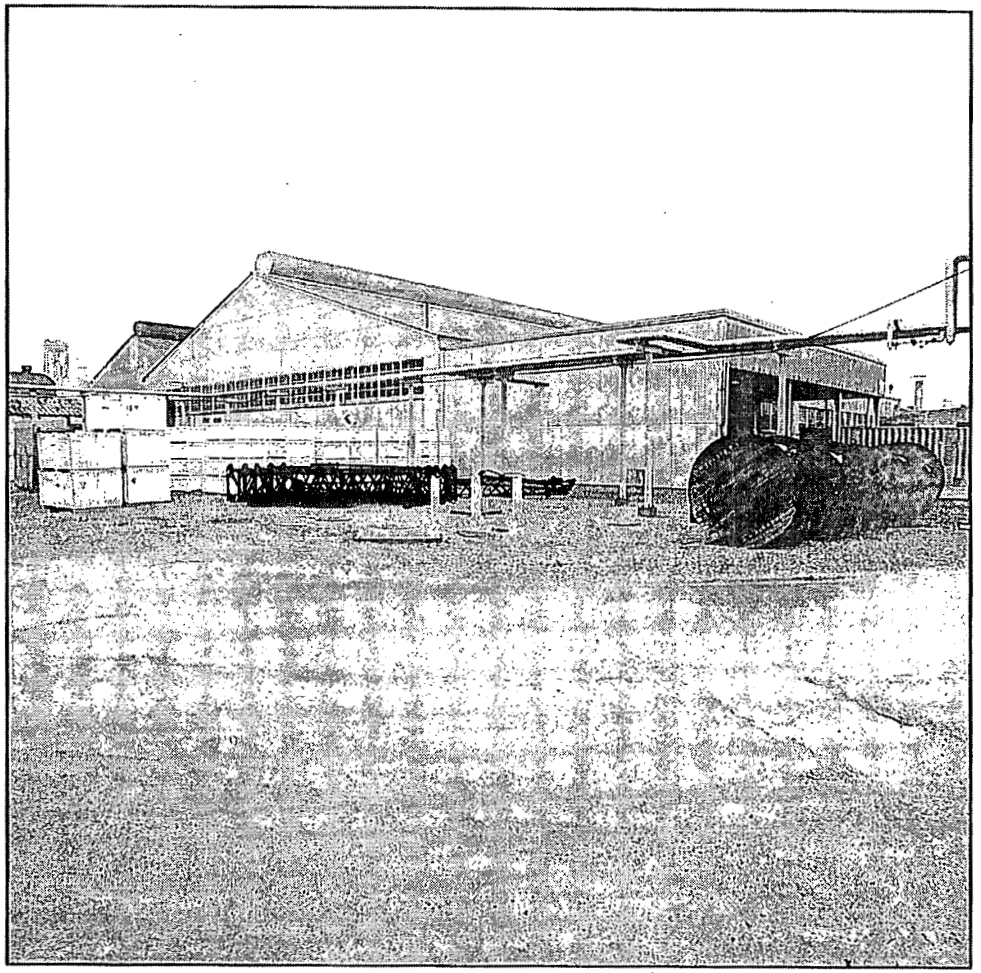
63X-5500-X-0003

FORMAT REVISED 11/5/96 FDF4.DOH

COMPONENT 6A - METALS FABRICATION PLANT

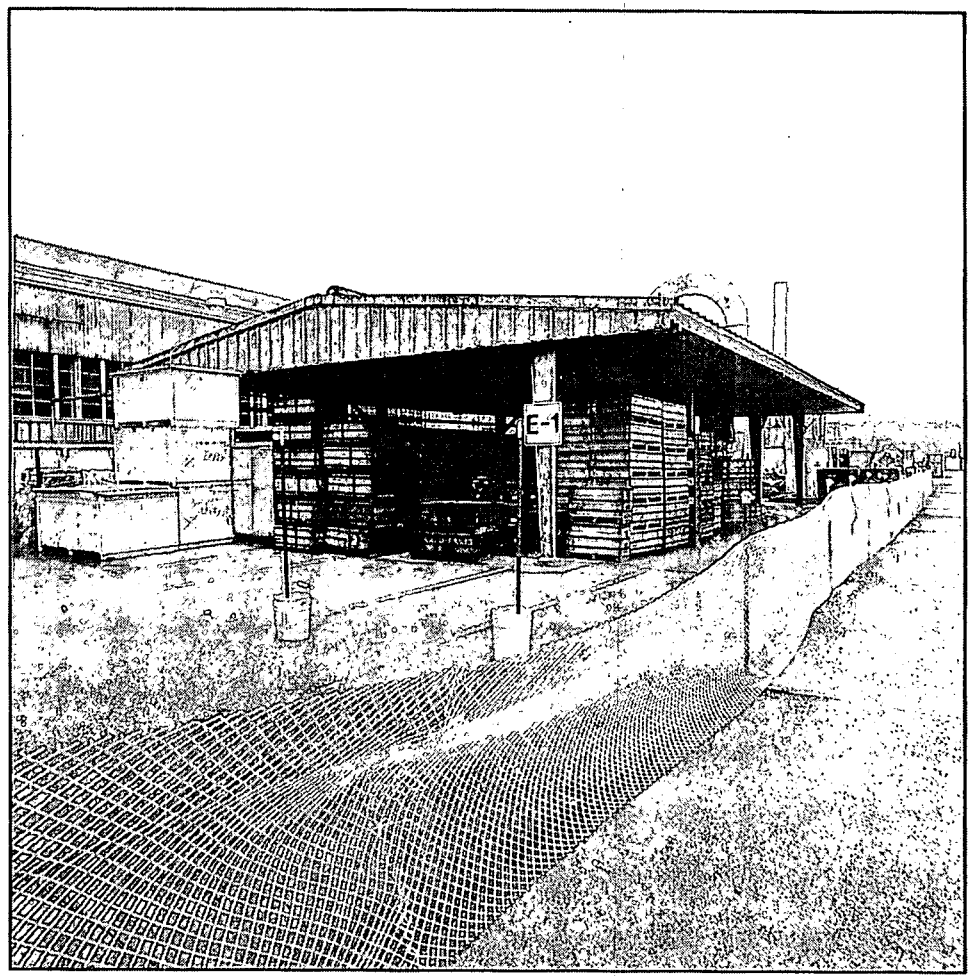


FEMP Neg. No. 6840-116



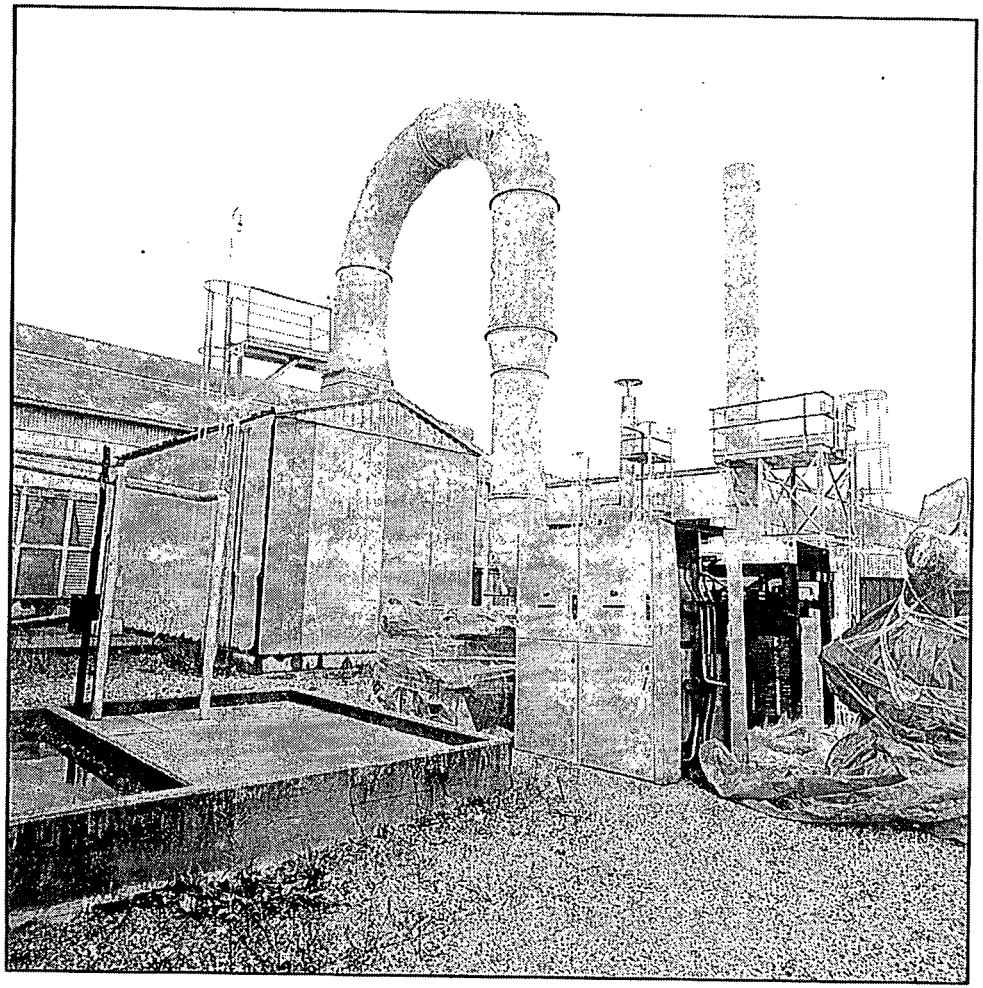
FEMP Neg. No. 6840-125

COMPONENT 6B - PLANT 6 COVERED STORAGE AREA



FEMP Neg. No. 6840-126

COMPONENT 6C - PLANT 6 ELECTROSTATIC PRECIPITATOR SOUTH



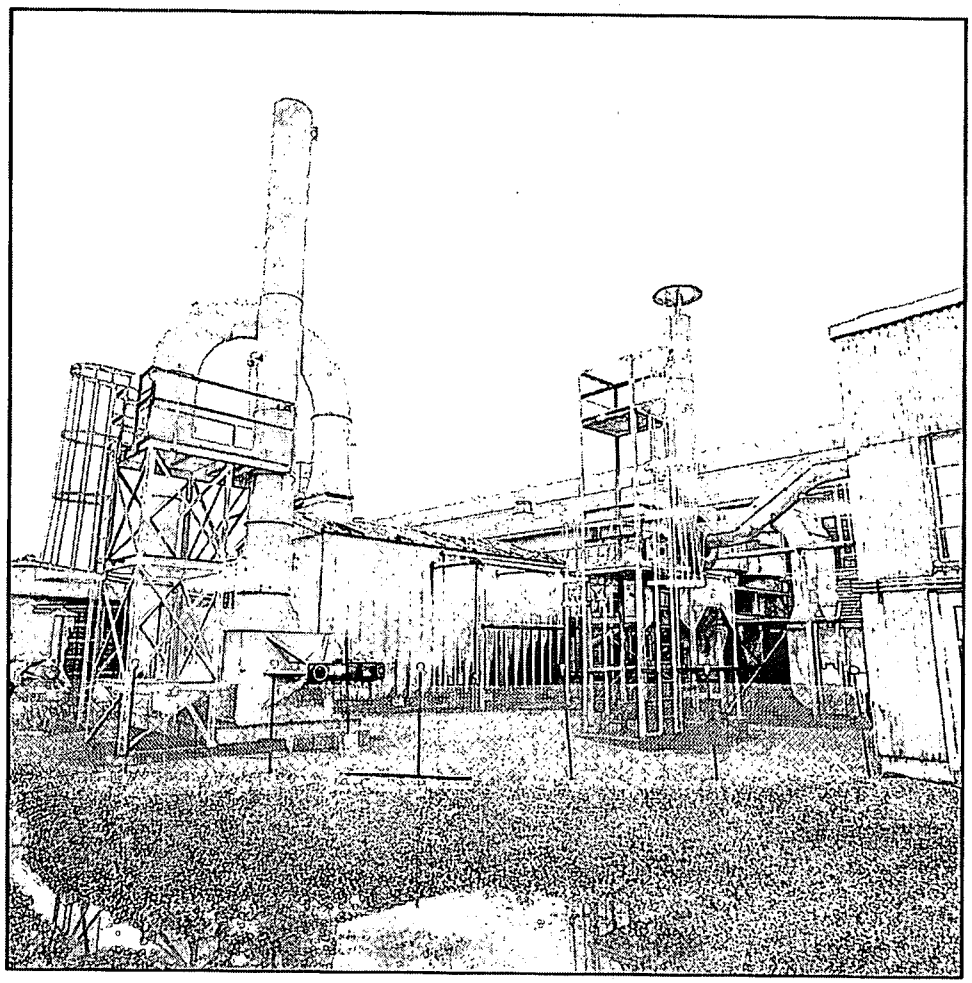
FEMP Neg. No. 6840-127

h81

2203

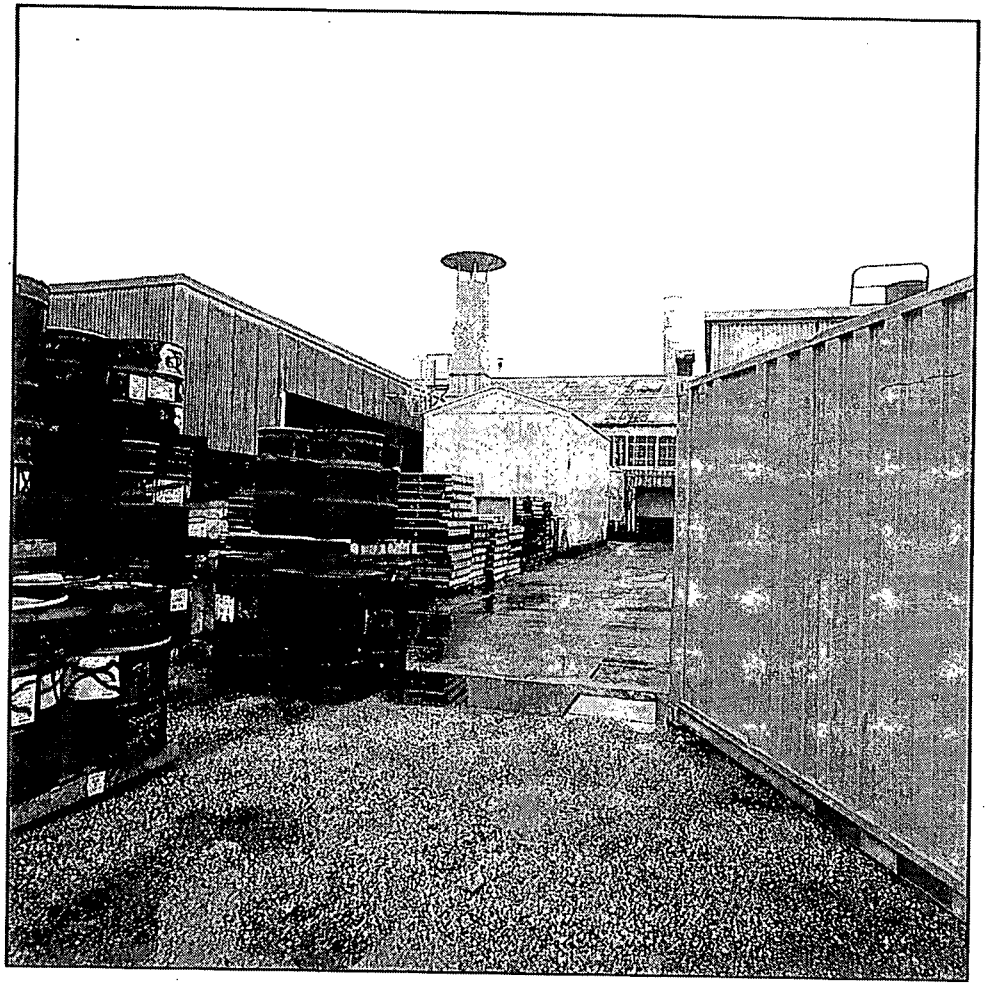
FERNALD
Environmental Management Project

COMPONENT 6D - PLANT 6 ELECTROSTATIC PRECIPITATOR CENTRAL



FEMP Neg. No. 6840-128

COMPONENT 6E - PLANT 6 ELECTROSTATIC PRECIPITATOR NORTH

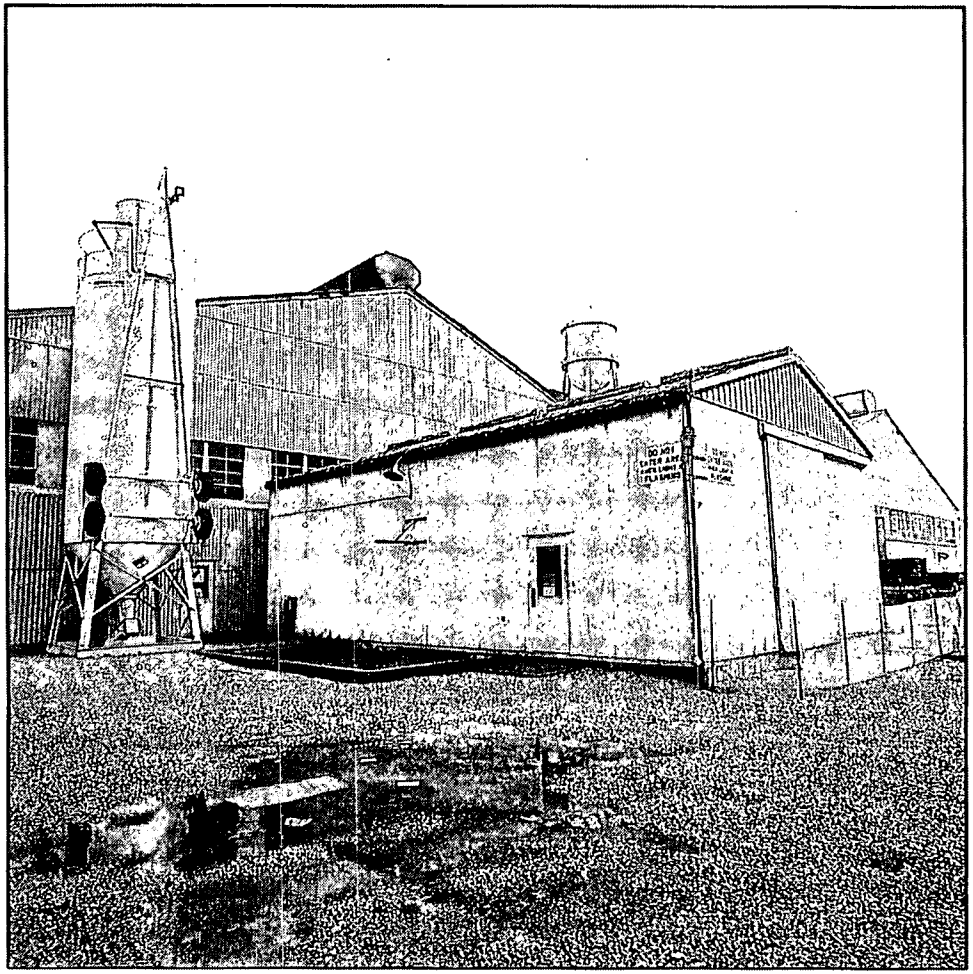


FEMP Neg. No. 6840-129

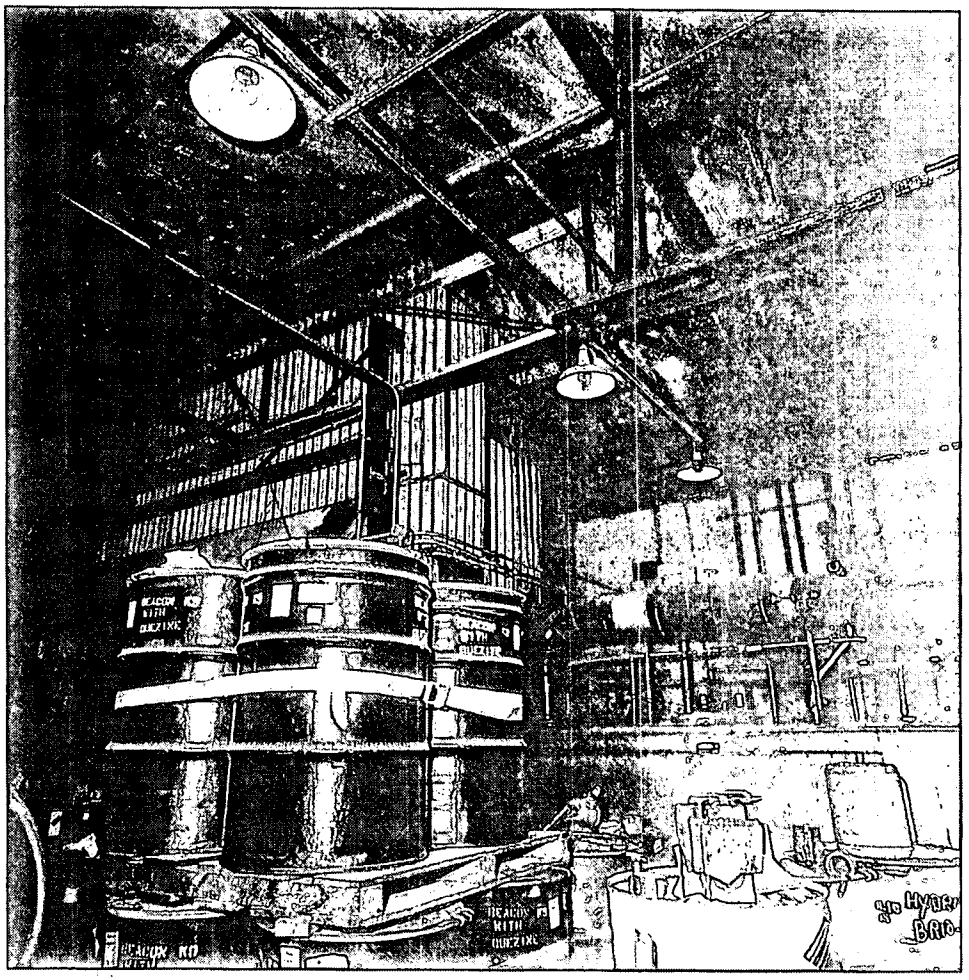
281

FERNALD
Environmental Management Project

COMPONENT 6F - SALT-OIL HEAT TREATMENT BUILDING

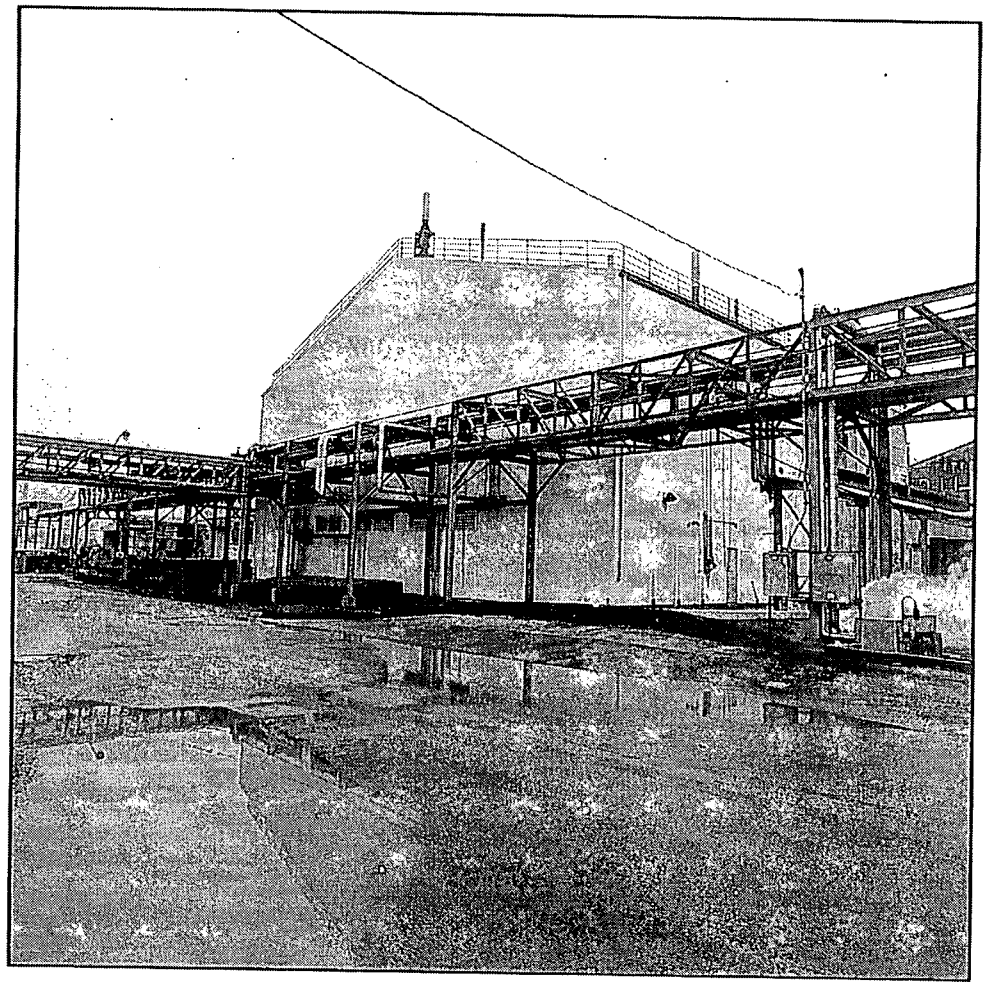


FEMP Neg. No. 6840-121



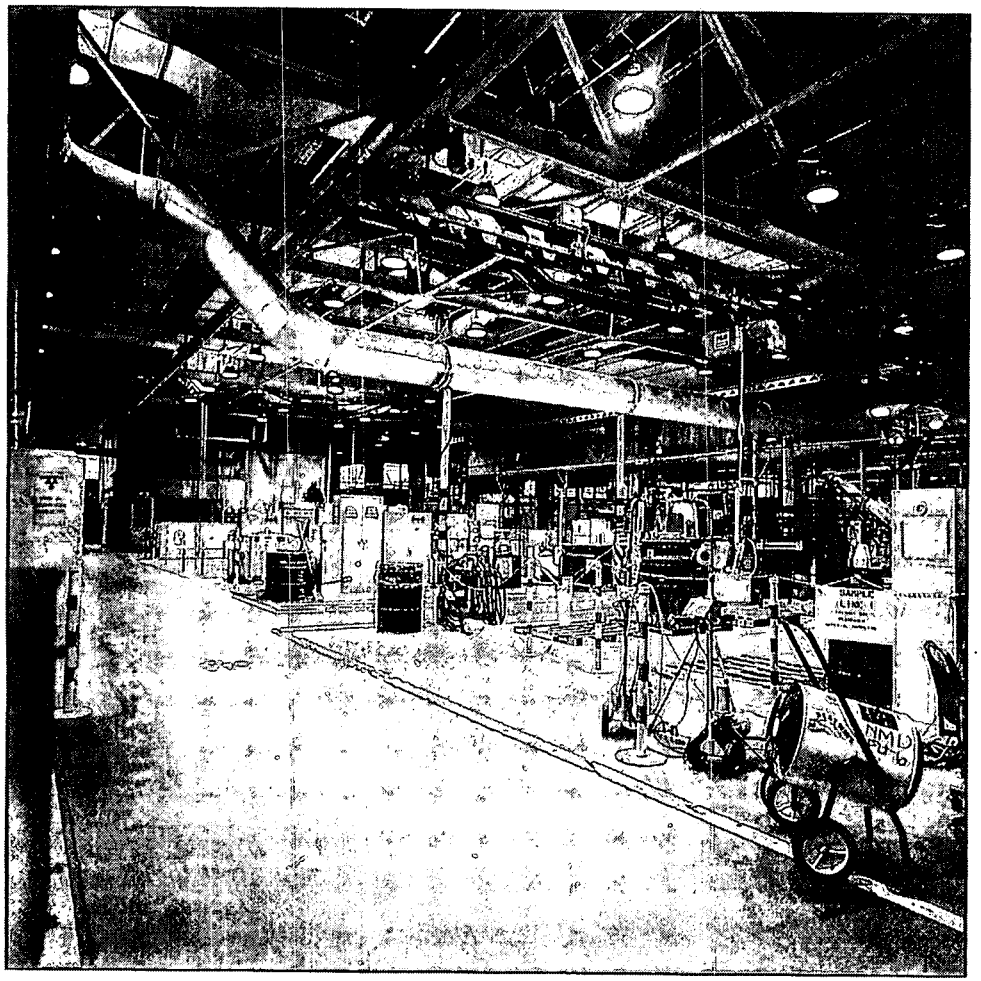
FEMP Neg. No. 6840-124

COMPONENT 6G - PLANT 6 SUMP BUILDING

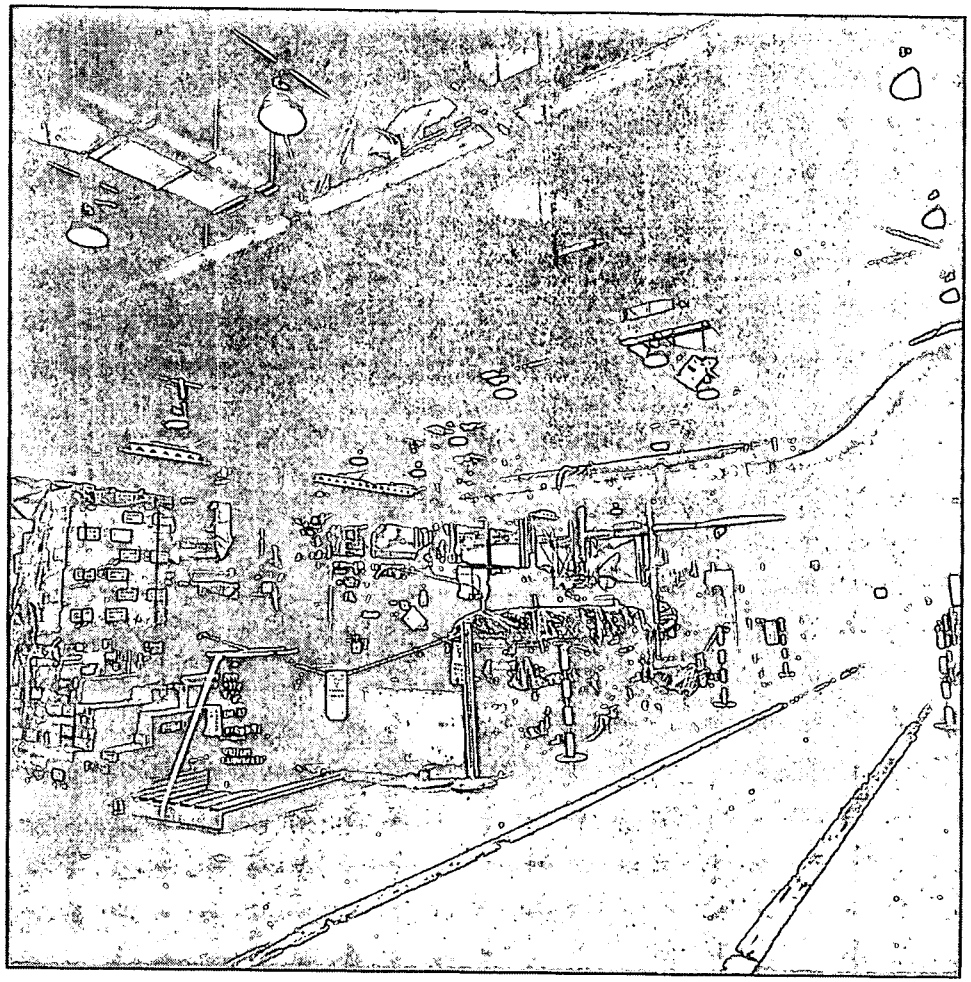


FEMP Neg. No. 6840-108

COMPONENT 6A - METALS FABRICATION PLANT

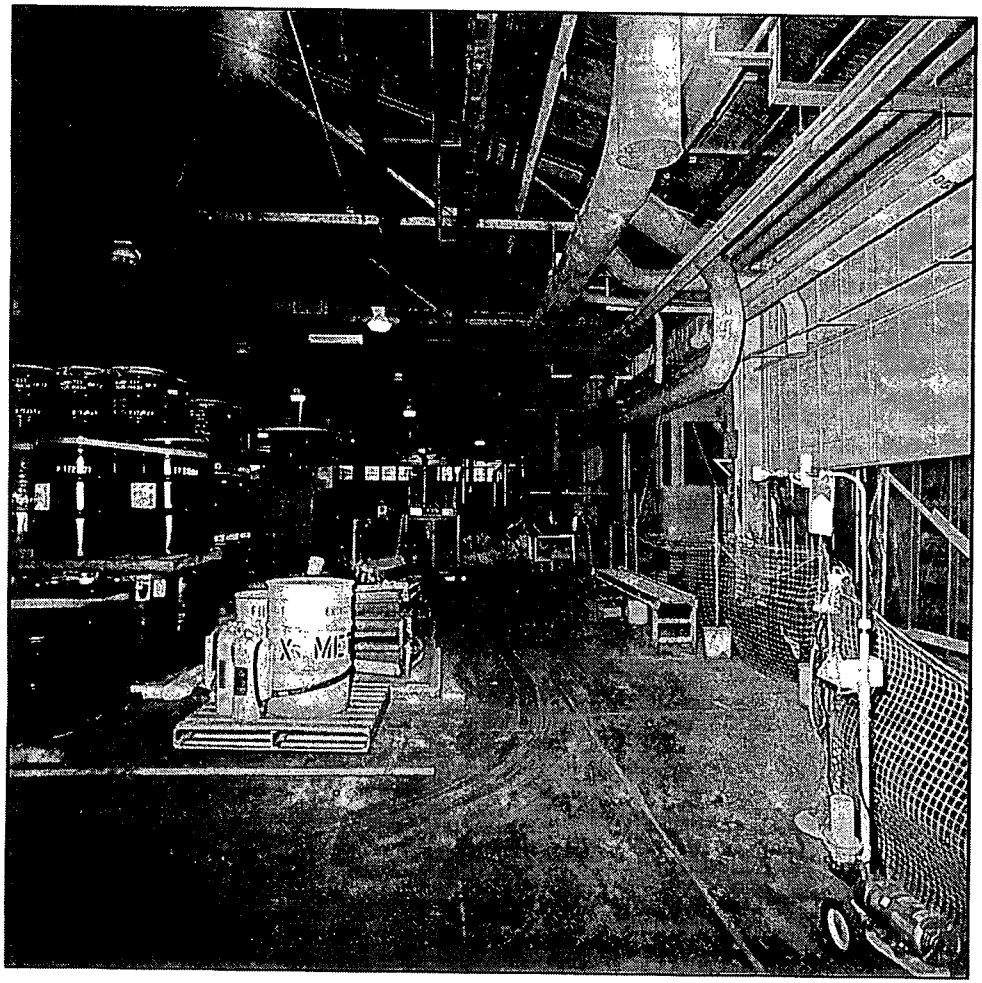


FEMP Neg. No. 6840-15

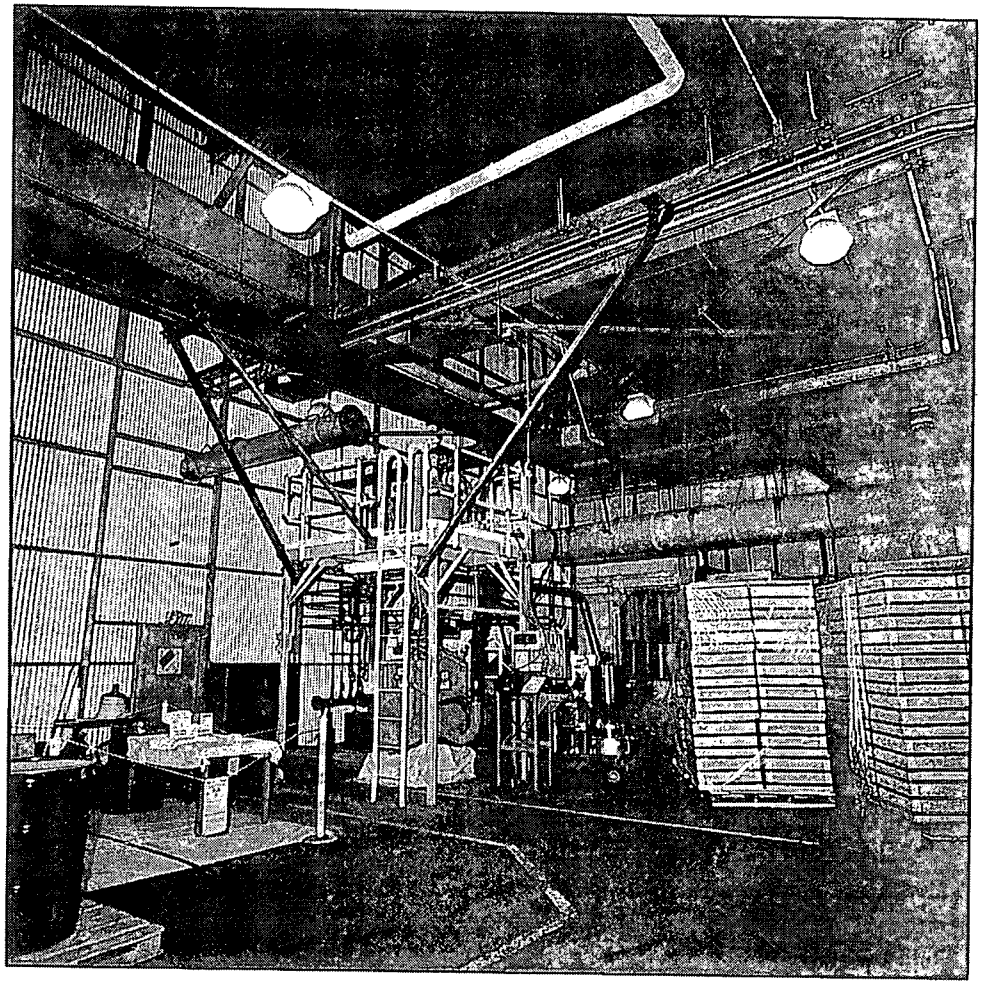


FEMP Neg. No. 6840-18

COMPONENT 6A - METALS FABRICATION PLANT

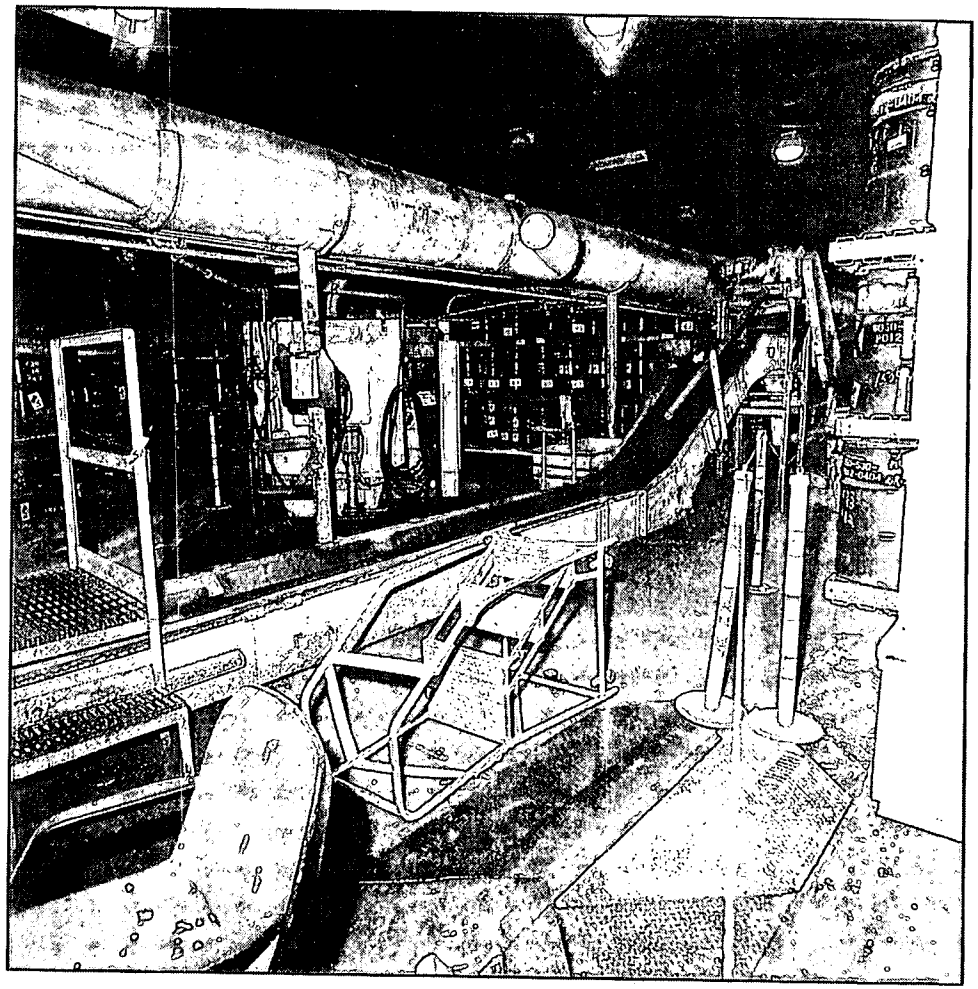


FEMP Neg. No. 6840-22



FEMP Neg. No. 6840-27

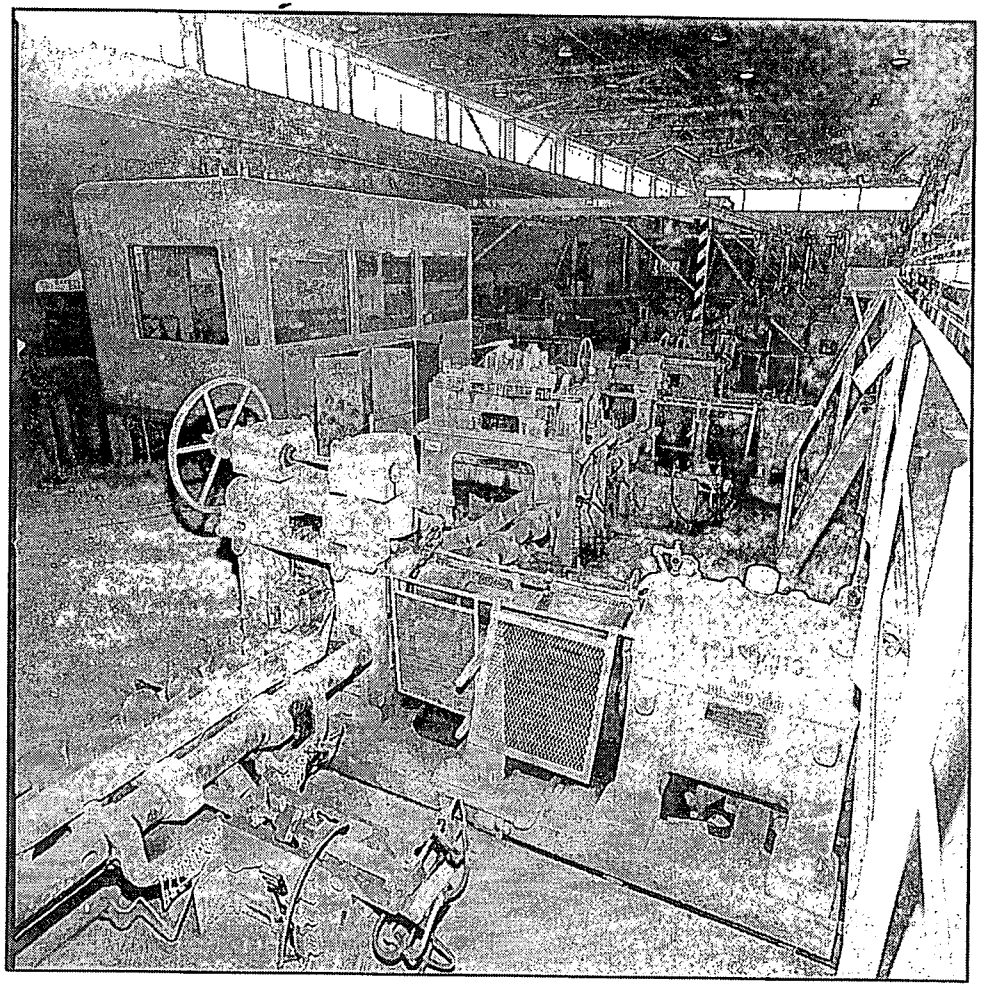
COMPONENT 6A - METALS FABRICATION PLANT



FEMP Neg. No. 6460-93

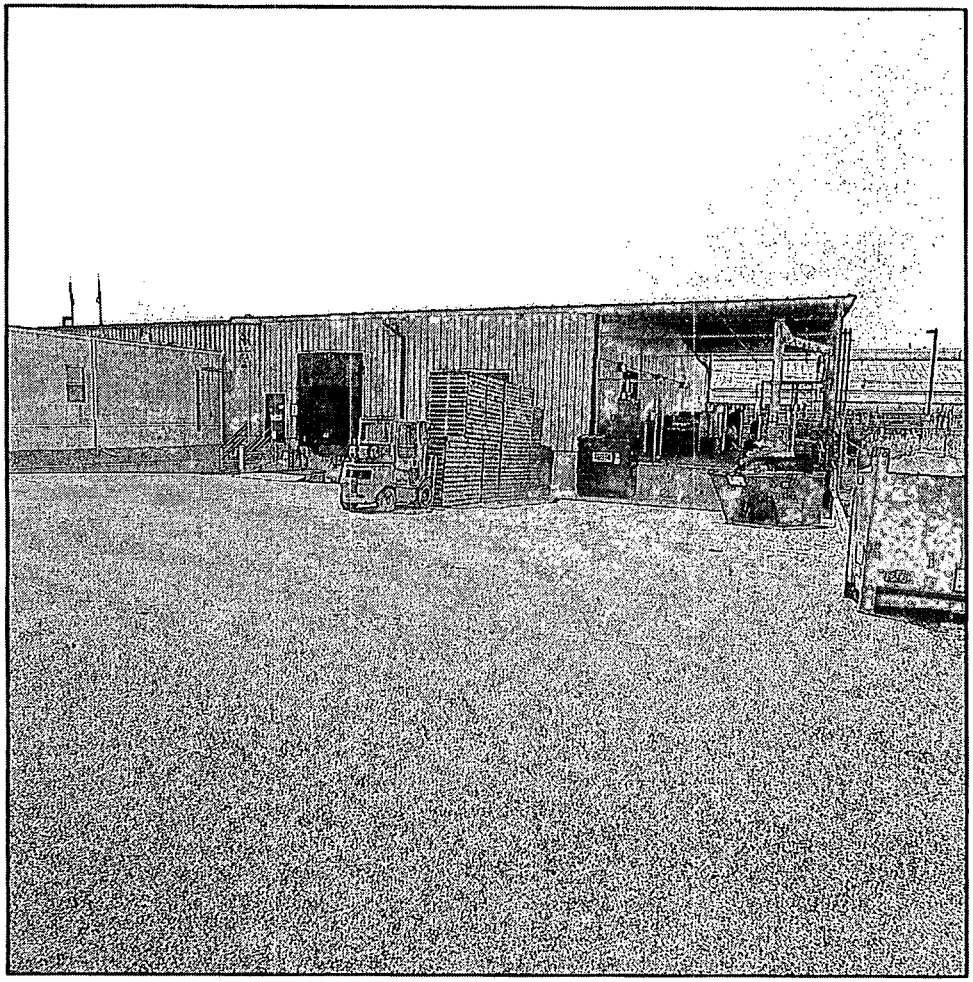
COMPONENT 6A - METALS FABRICATION PLANT

FEMP Neg. No. 6460-23

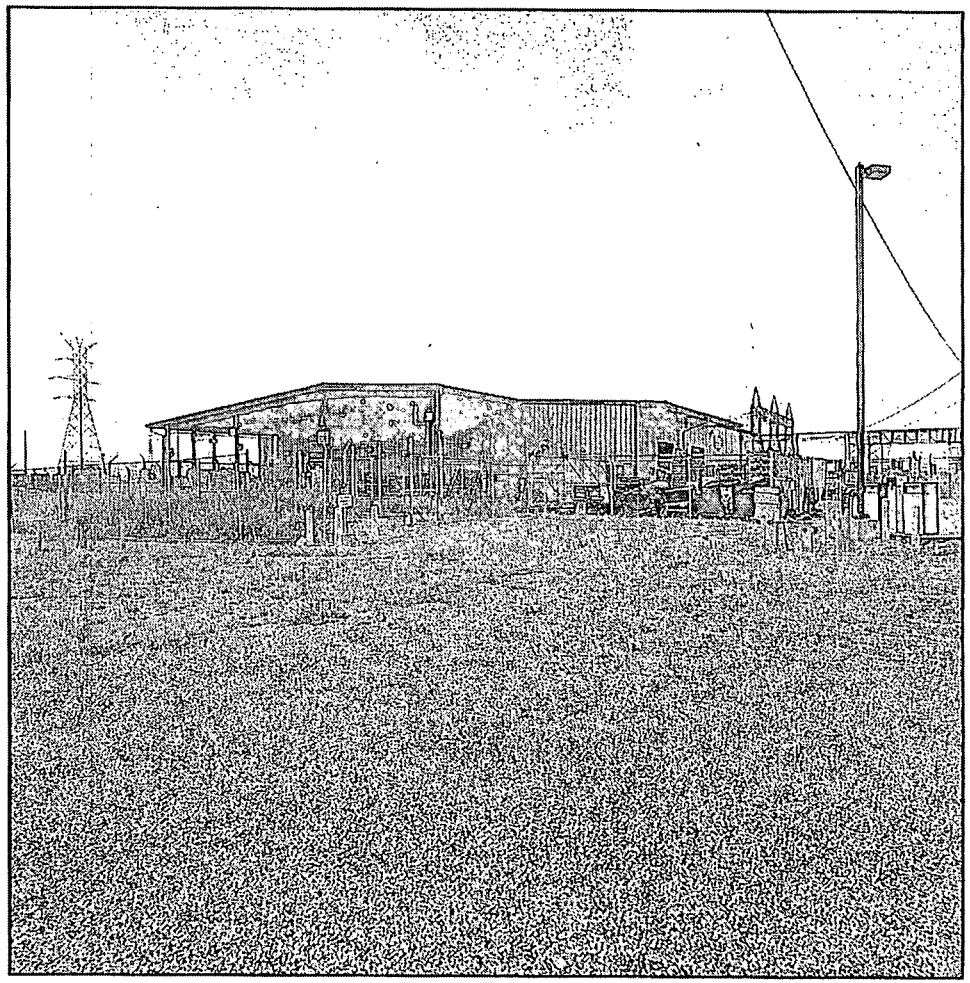


FEMP Neg. No. 6460-19

COMPONENT 82A - 82A RIMIA WAREHOUSE

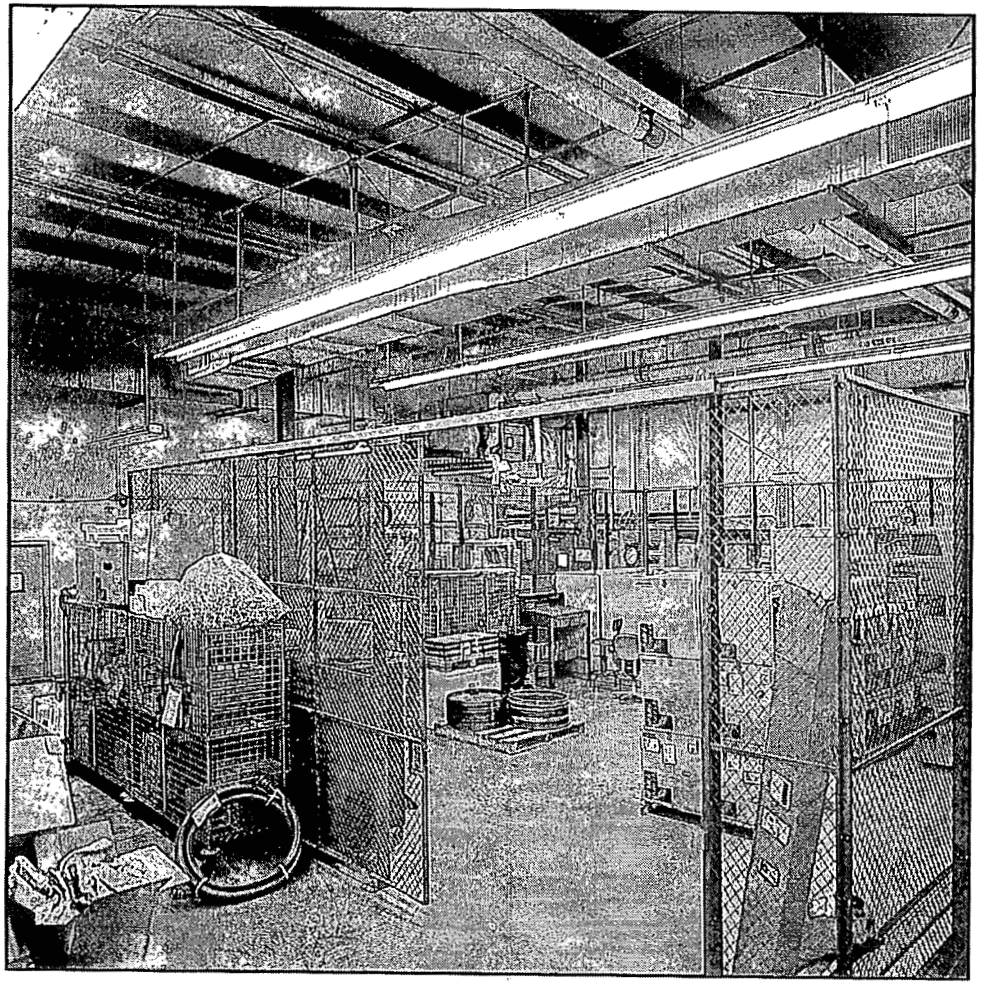


FEMP Neg. No. 6940-14

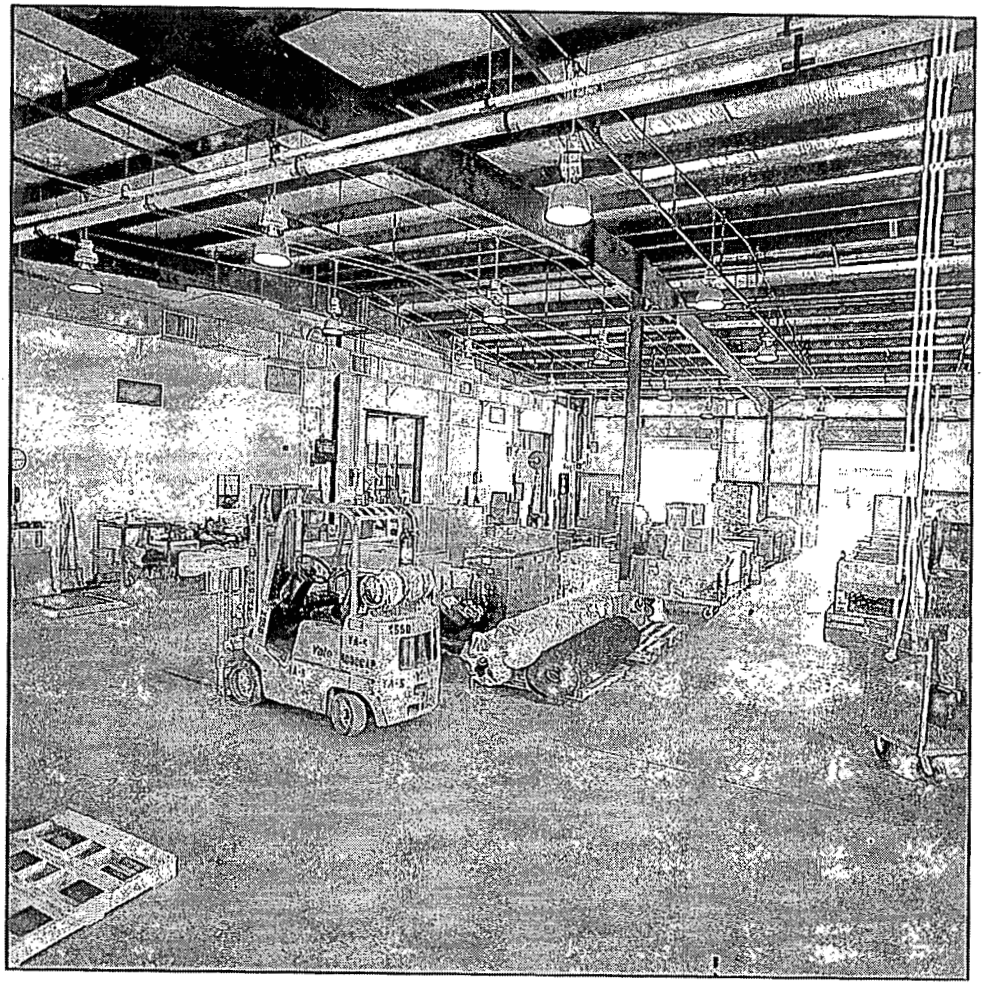


FEMP Neg. No. 6940-30

COMPONENT 82A - 82A RIMIA WAREHOUSE

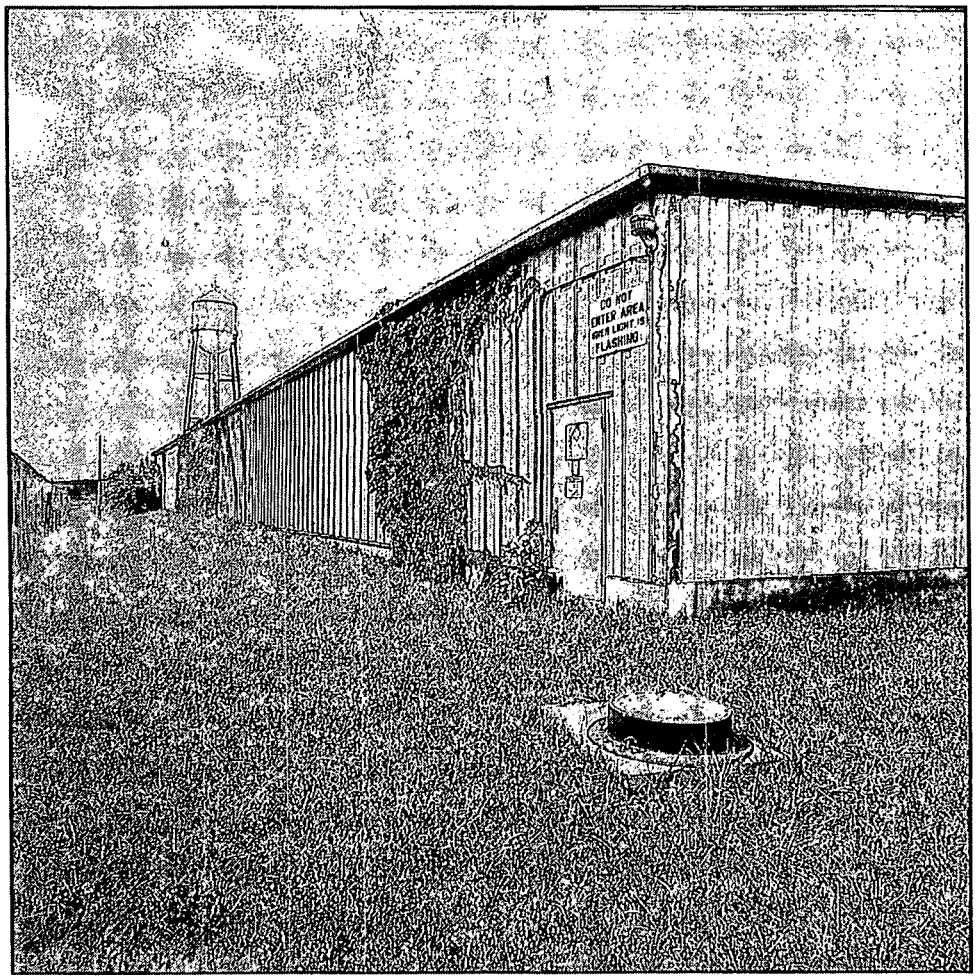


FEMP Neg. No. 6940-17

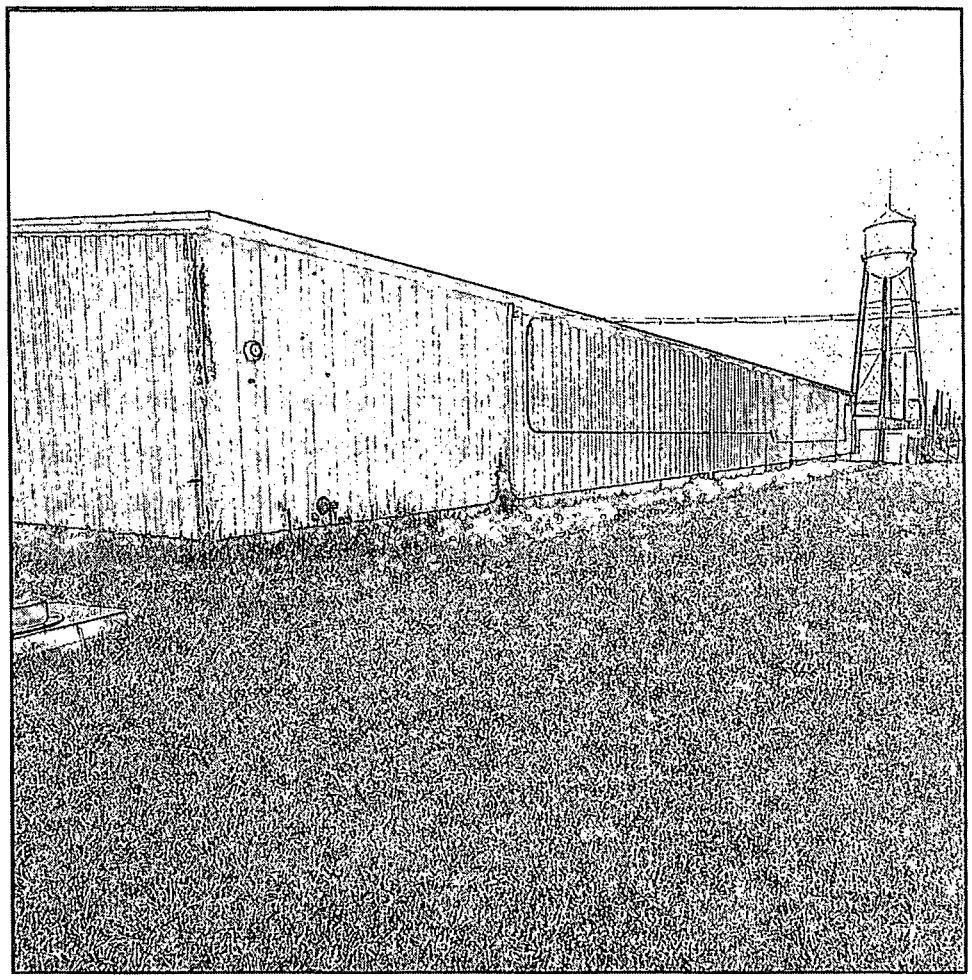


FEMP Neg. No. 6940-15

COMPONENT 77 - 77 WAREHOUSE

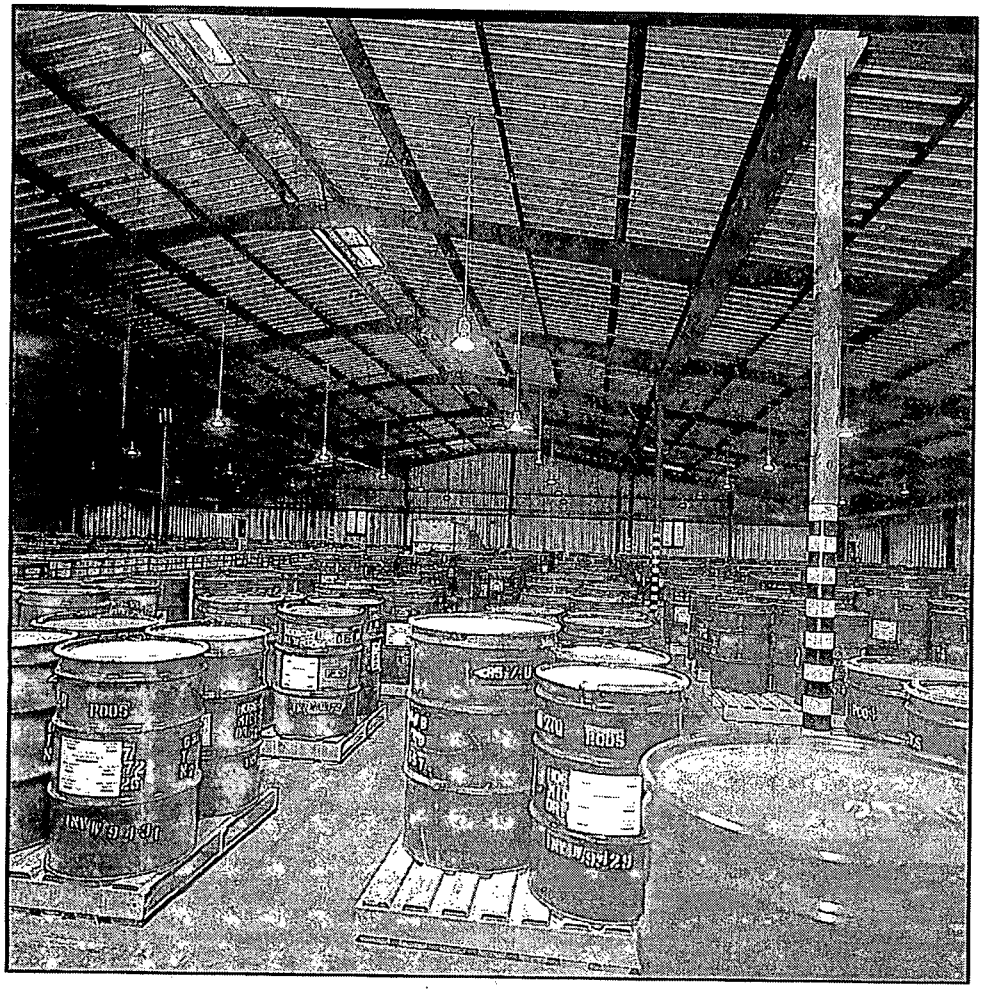


FEMP Neg. No. 6940-26

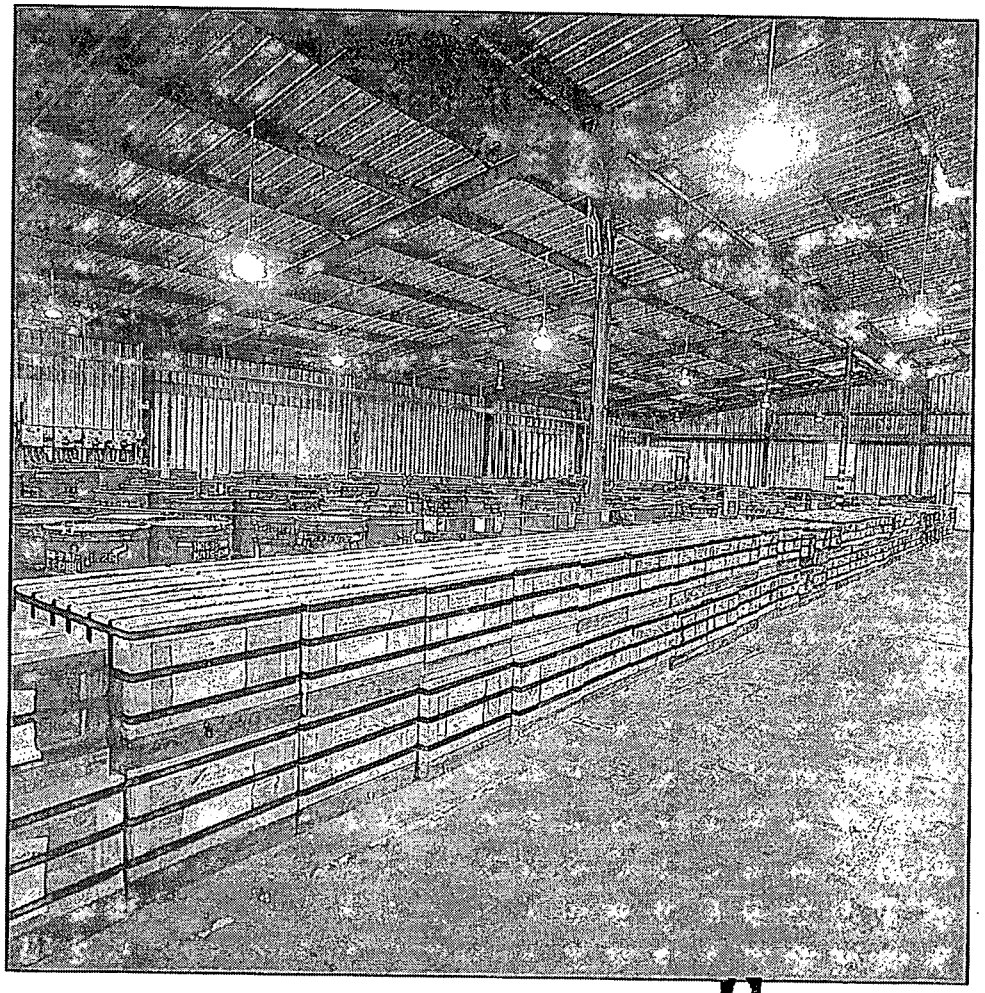


FEMP Neg. No. 6940-24

COMPONENT 77 - 77 WAREHOUSE

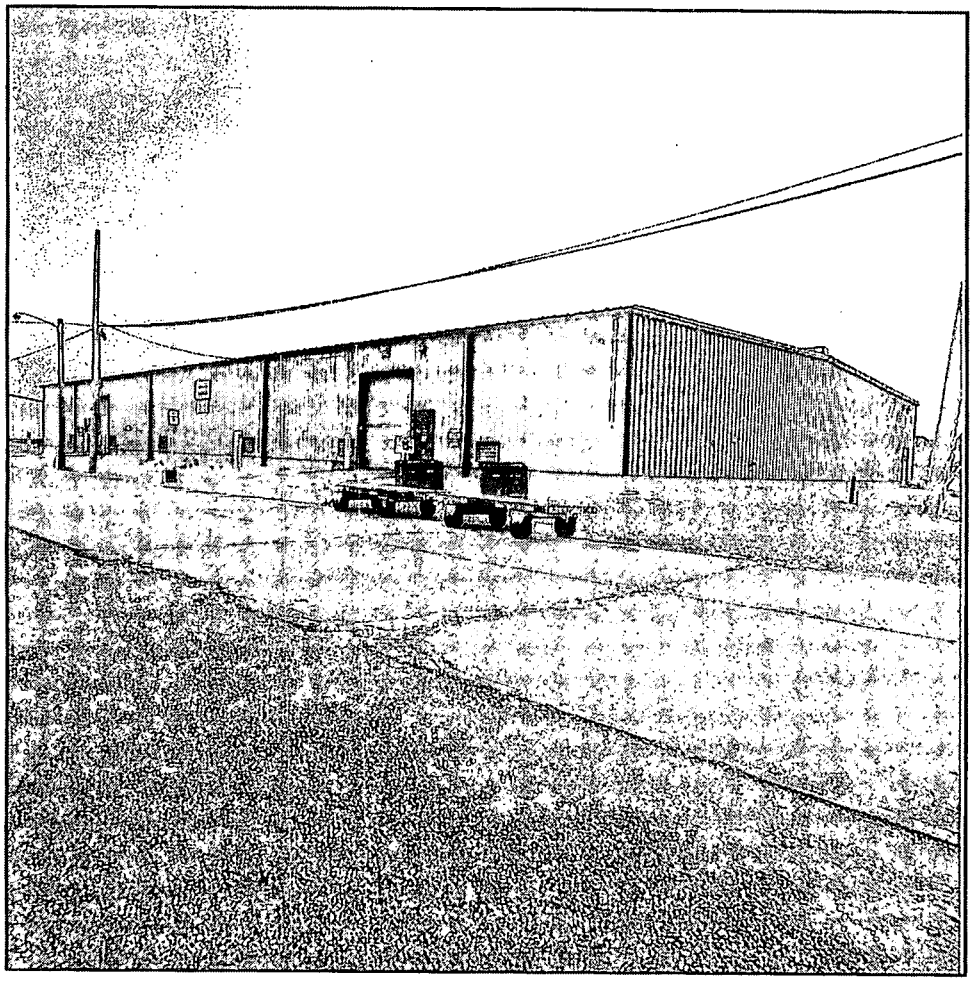


FEMP Neg. No. 6940-8

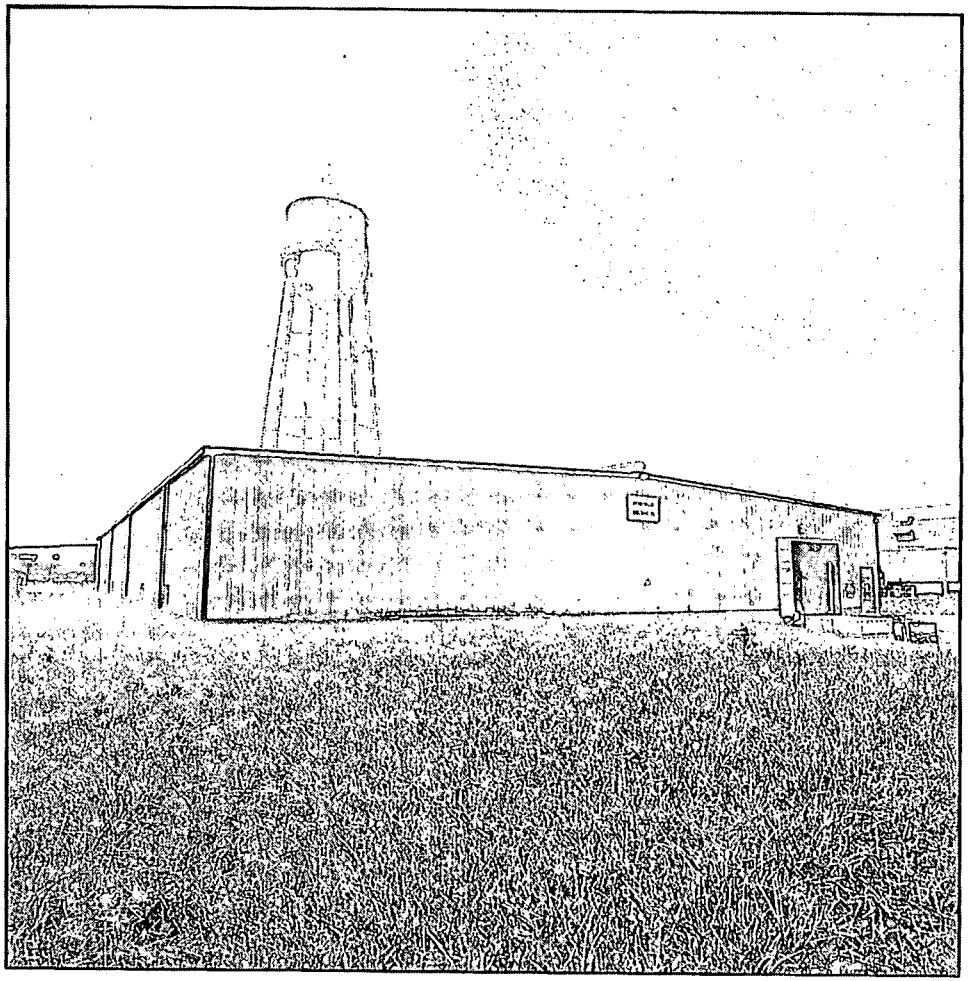


FEMP Neg. No. 6940-11

COMPONENT 79 - 79 WAREHOUSE

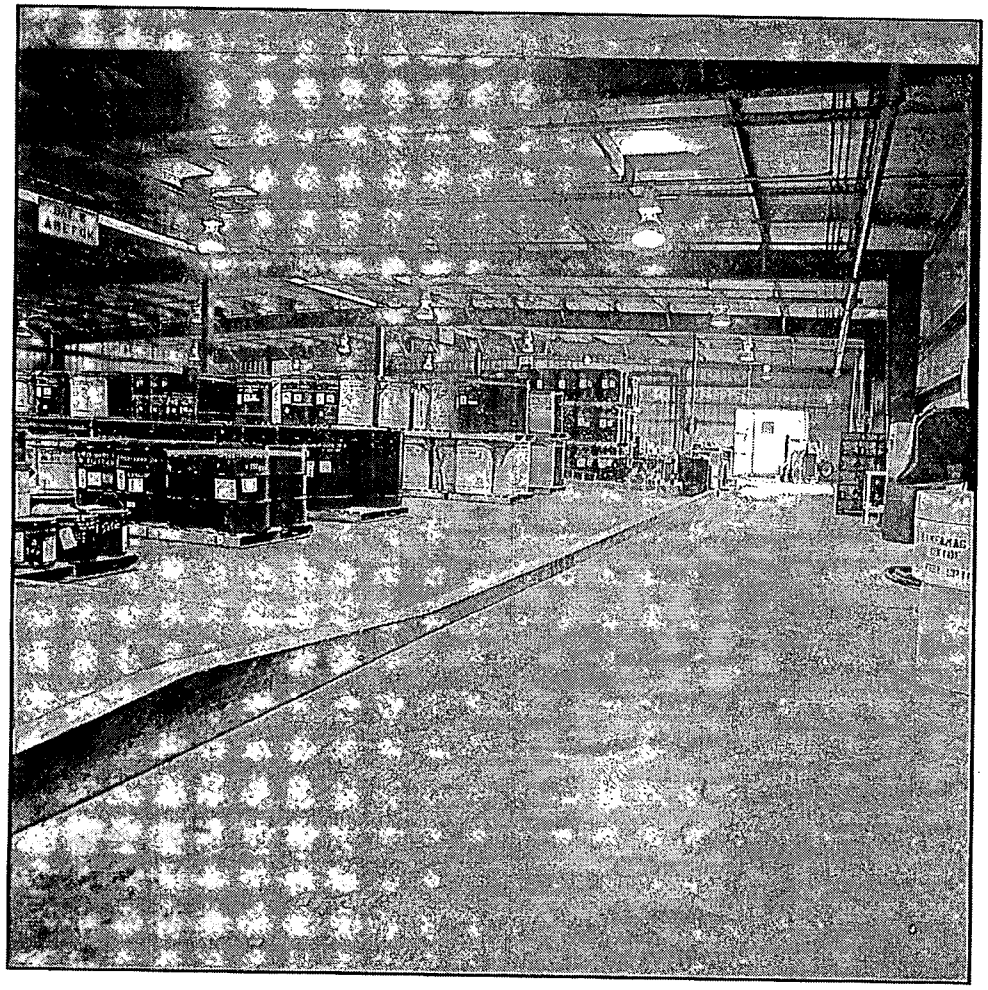


FEMP Neg. No. 6940-29

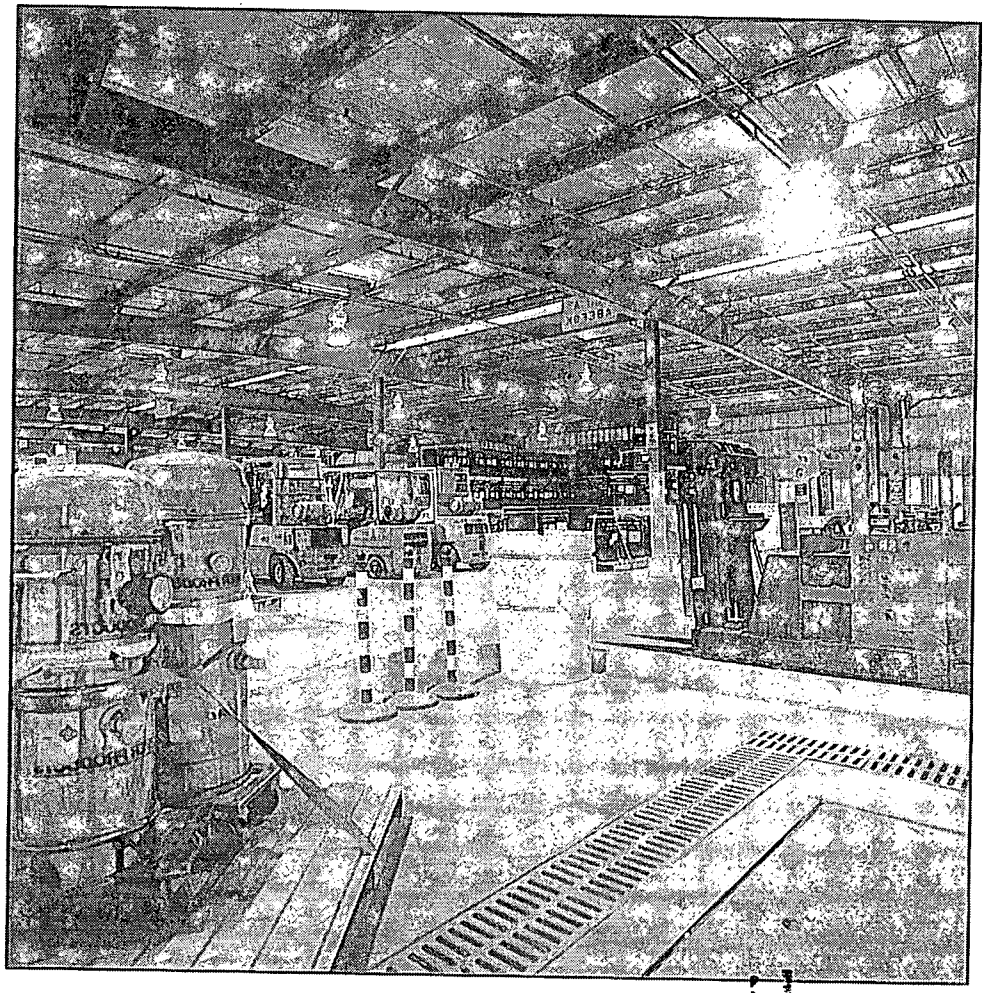


FEMP Neg. No. 6940-28

COMPONENT 79 - 79 WAREHOUSE

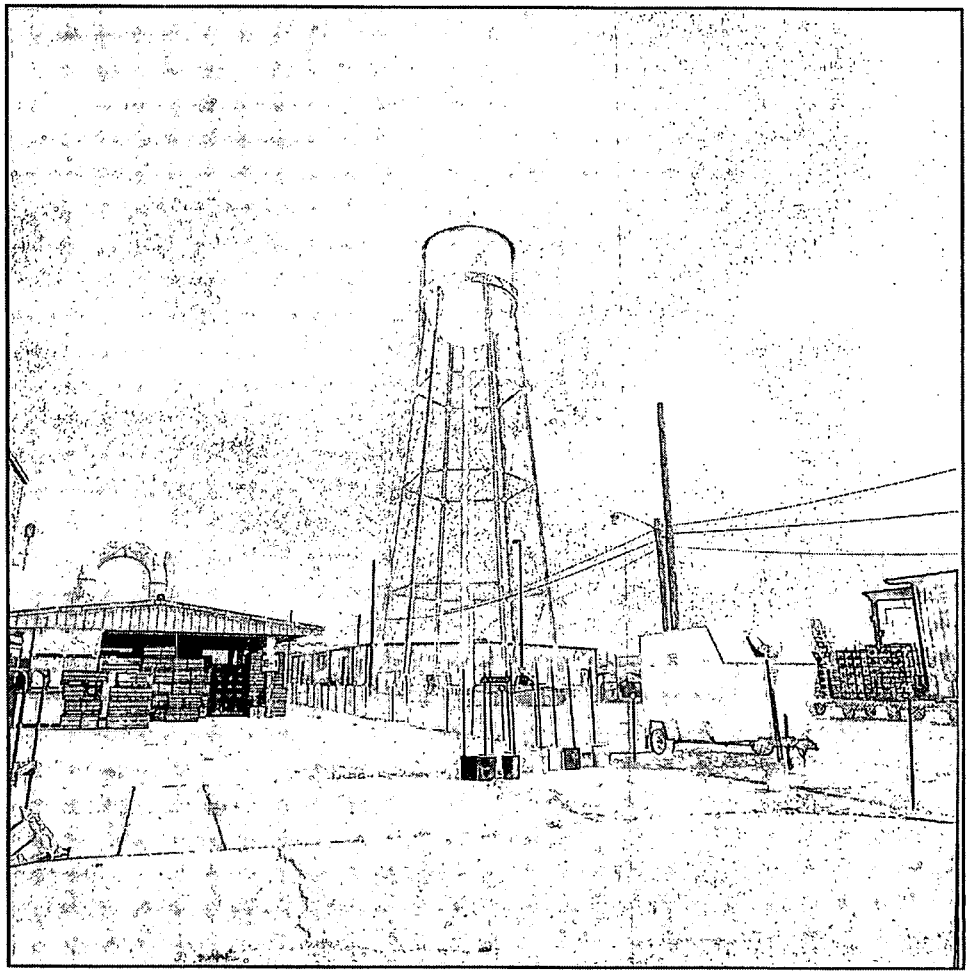


FEMP Neg. No. 6940-31



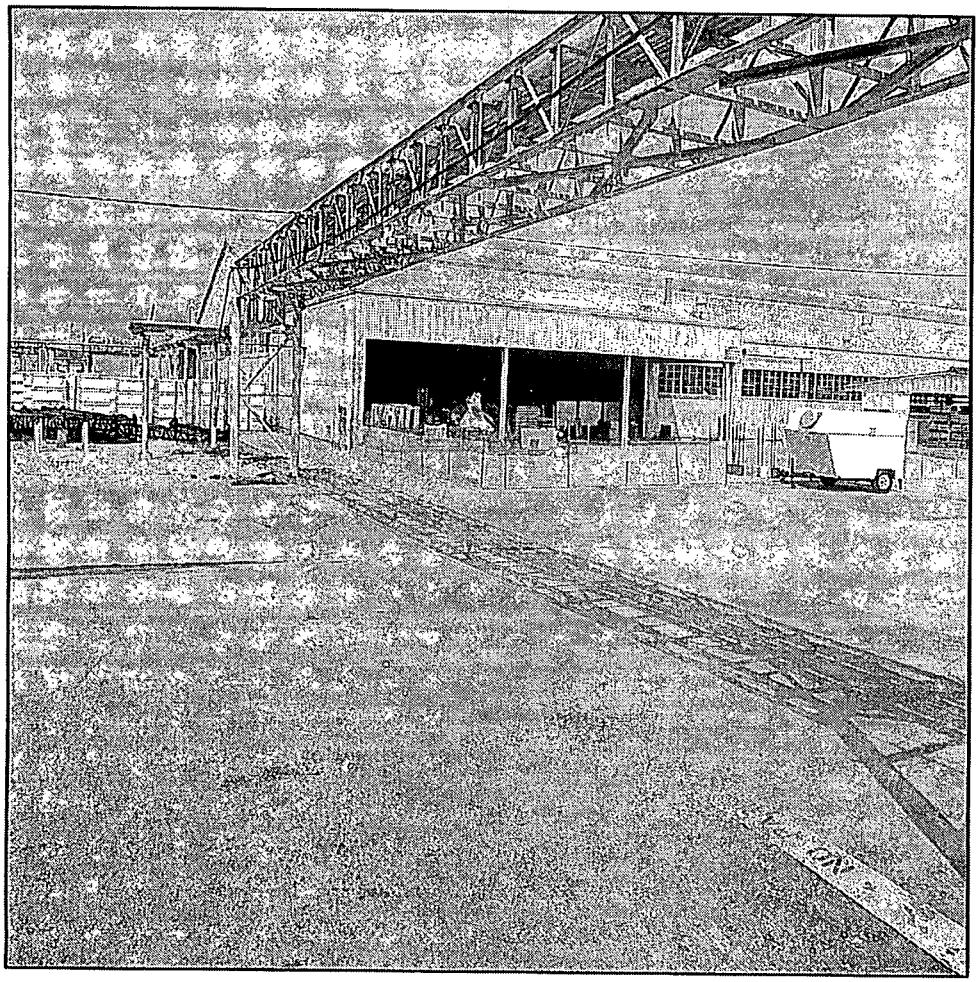
FEMP Neg. No. 6940-36

COMPONENT 20D - 20D ELEVATED POTABLE STORAGE TANK

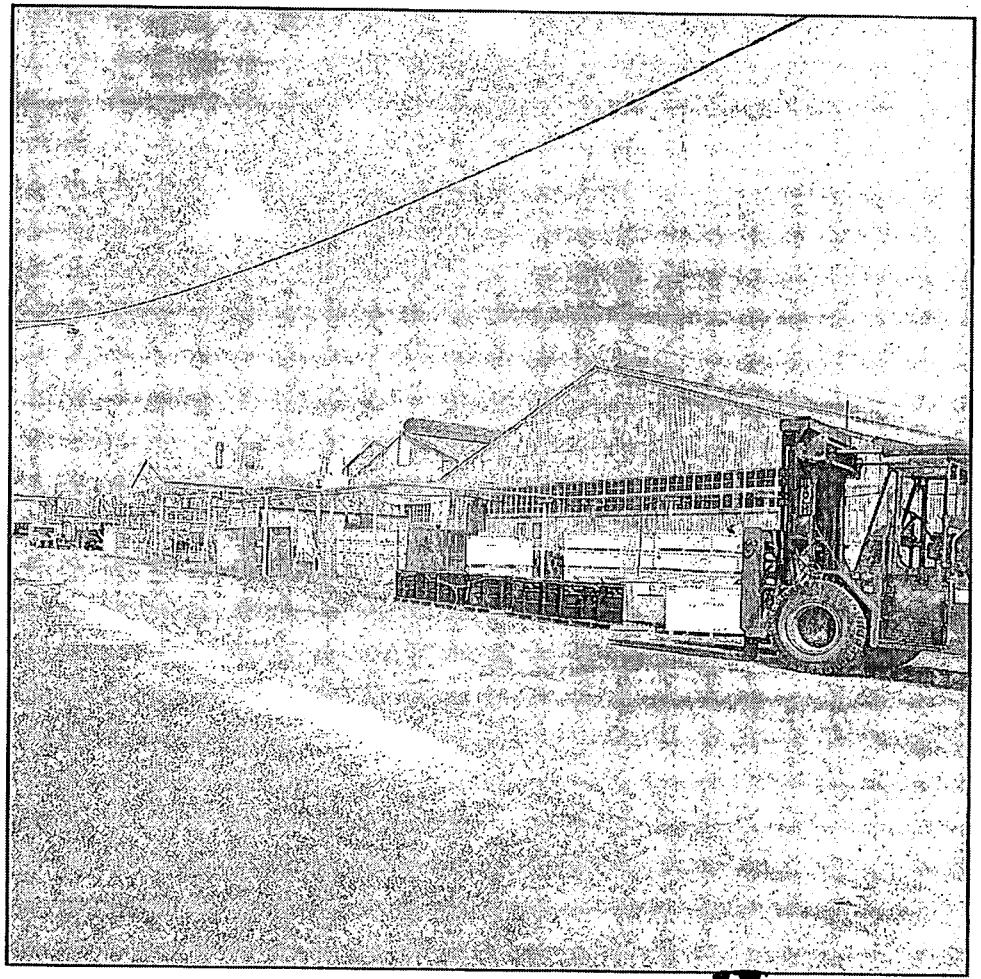


FEMP Neg. No. 6940-3

COMPONENT G008 - G008 PLANT 5 & PLANT 6 PIPE BRIDGES



FEMP Neg. No. 6940-1

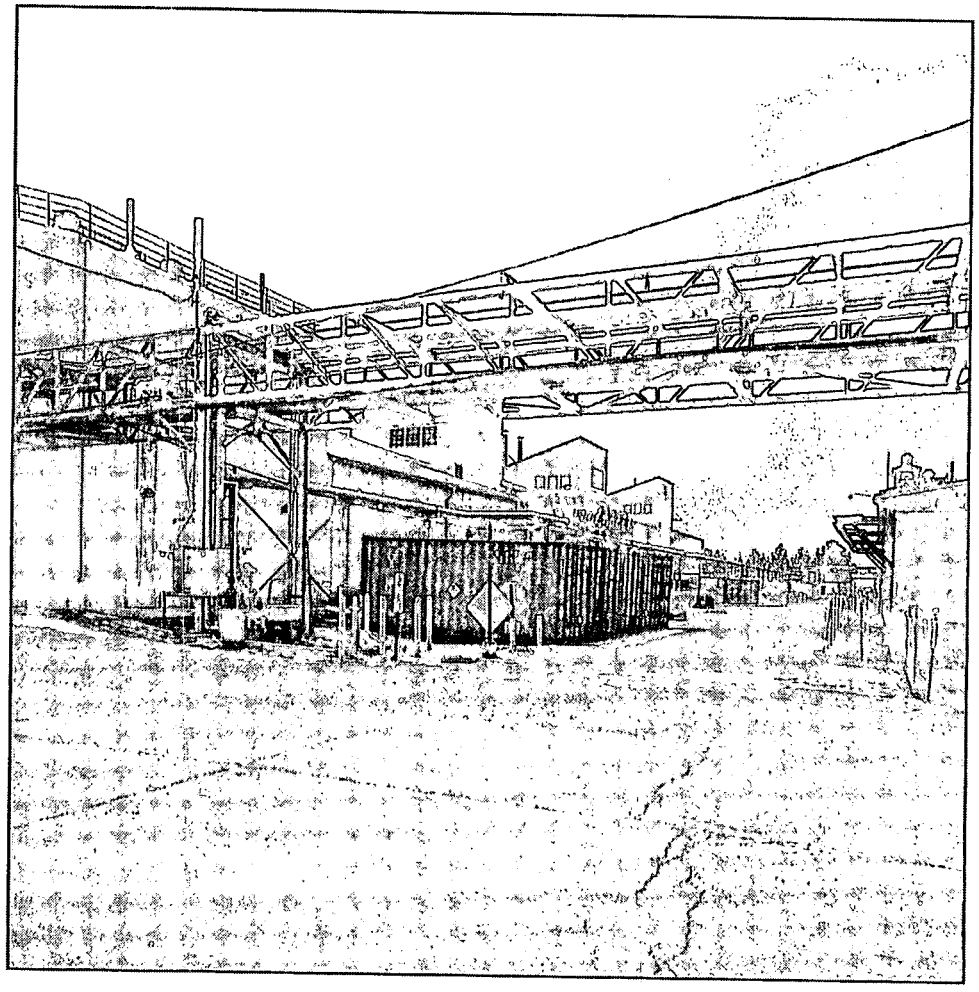


FEMP Neg. No. 6940-2

200

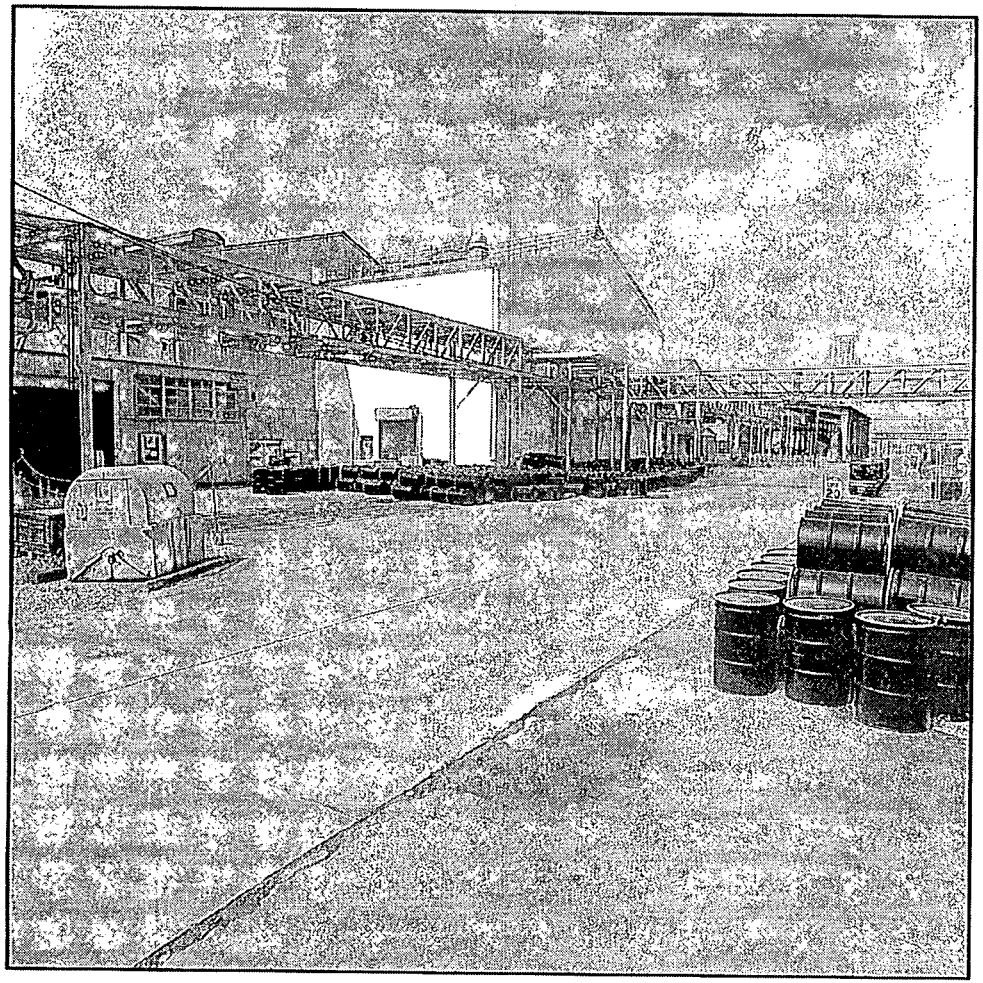
2203

COMPONENT G008 - GOO8 PLANT 5 & PLANT 6 PIPE BRIDGES



FEMP Neg. No. 6940-20

COMPONENT G008 - G008 PLANT 5 & PLANT 6 PIPE BRIDGES



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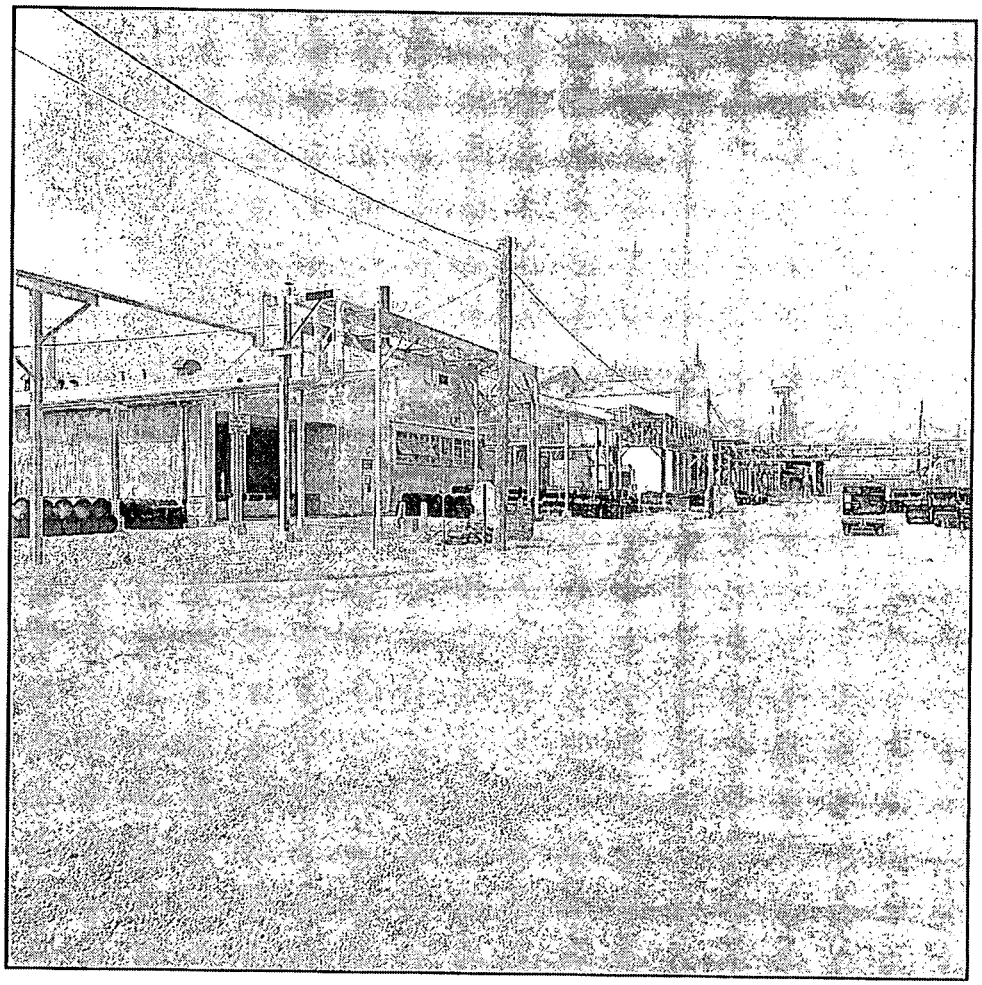
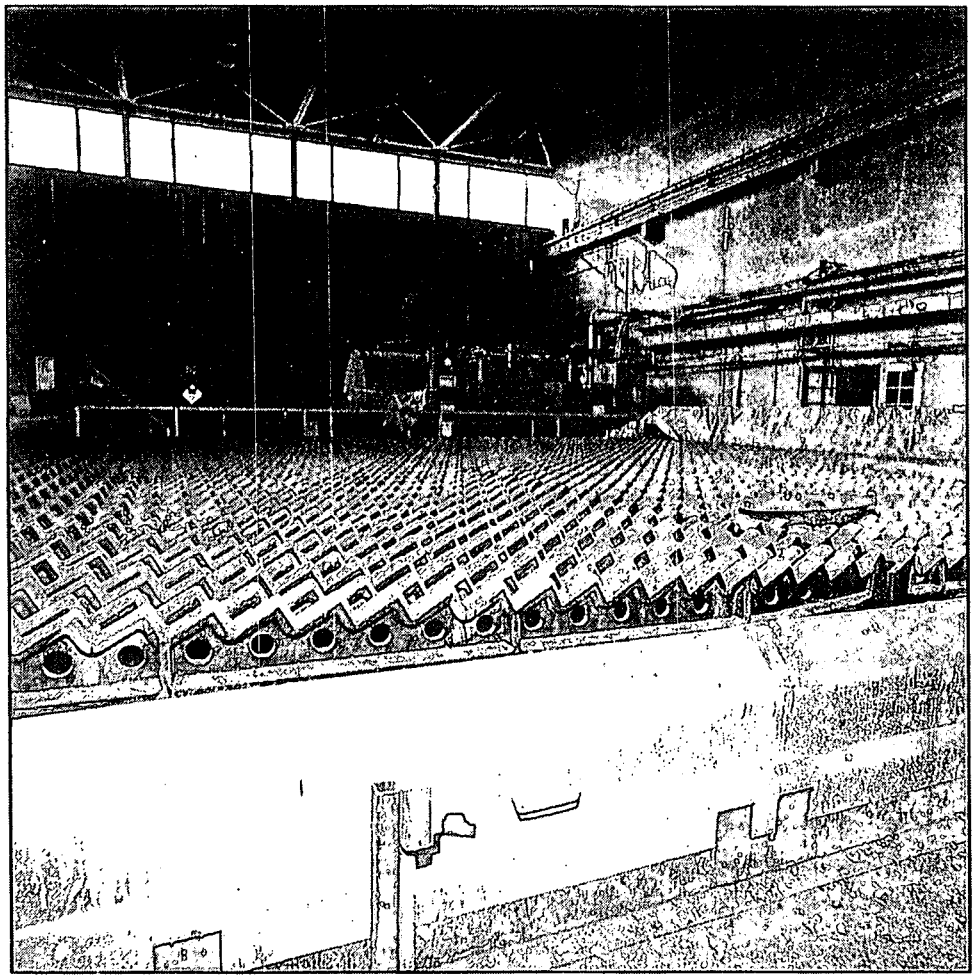
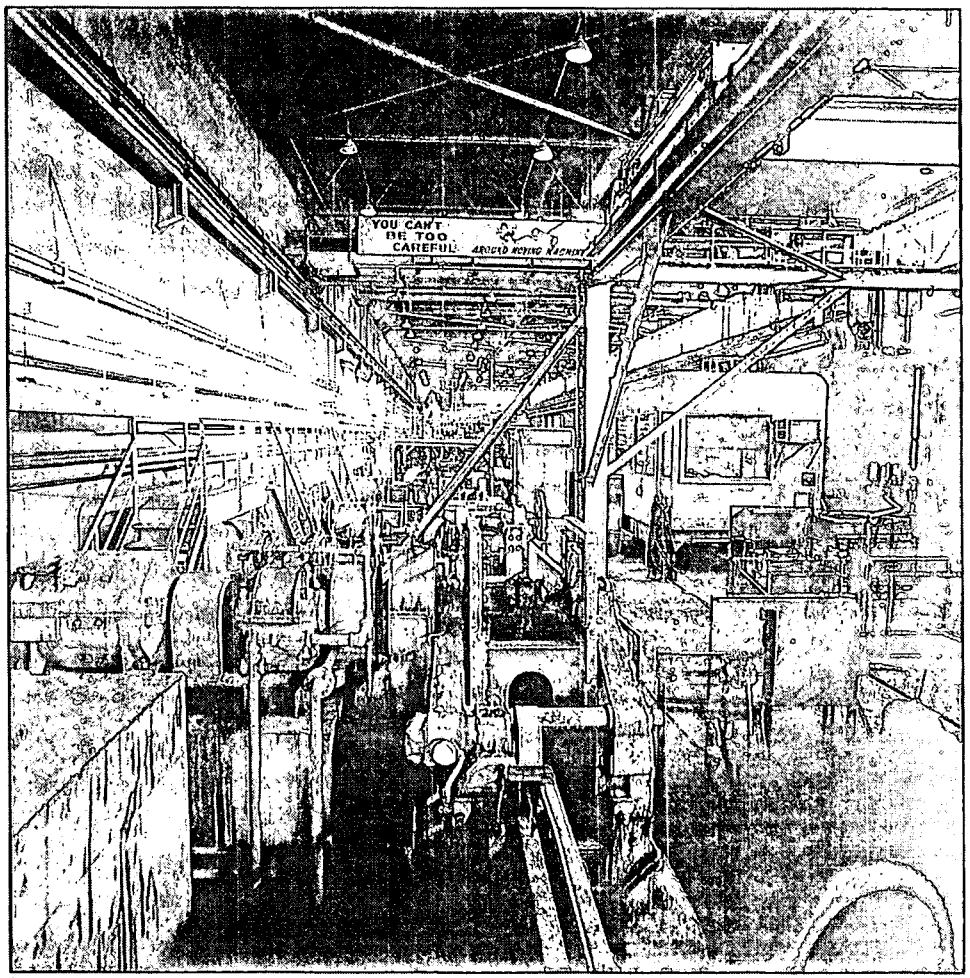


FEMP Neg. No. 6940-22

PLANT 6 COMPLEX



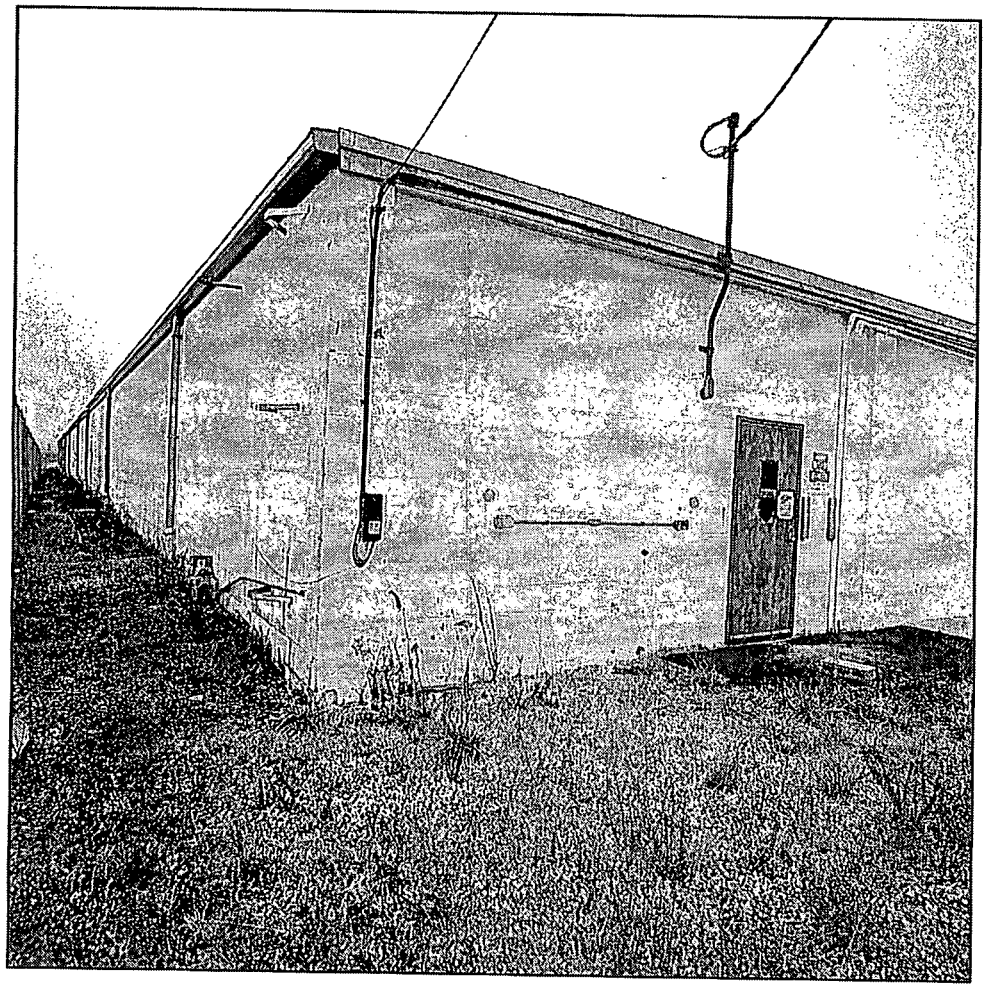
FEMP Neg. No. 6460.-7



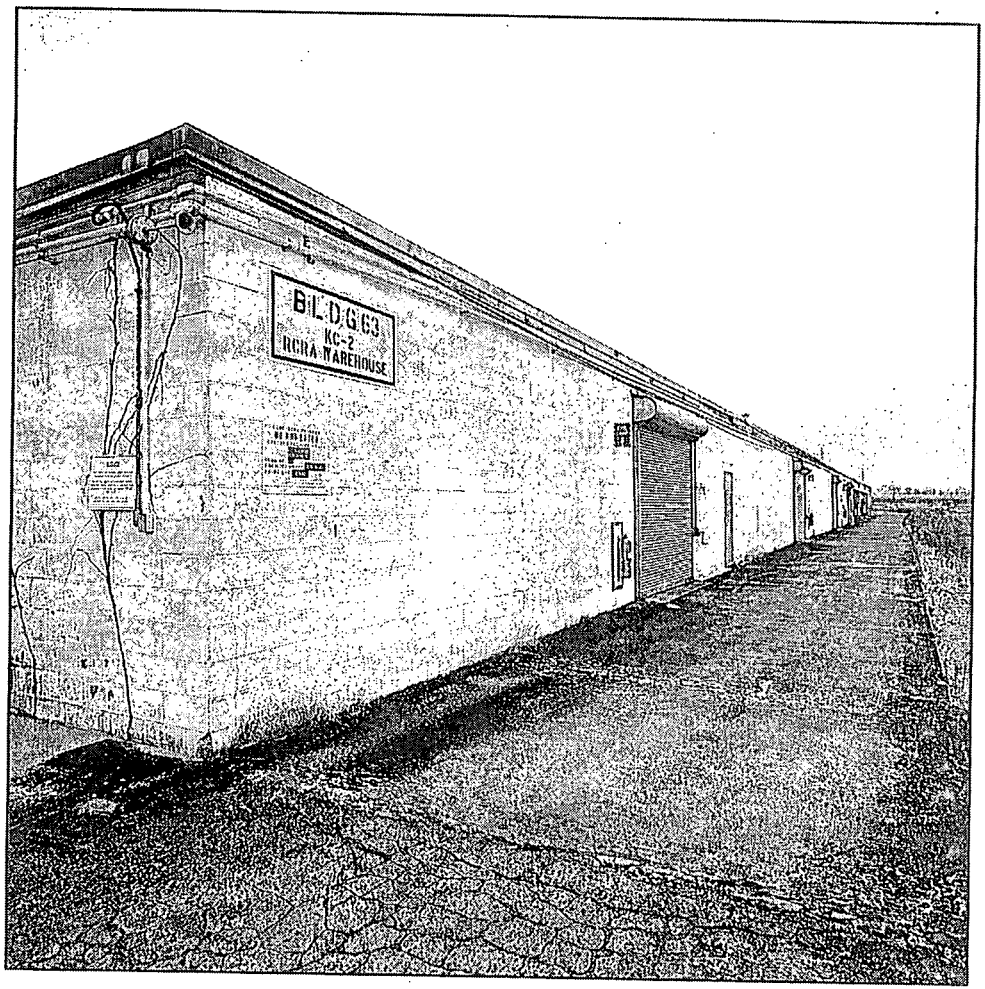
FEMP Neg. No. 6460-11

FERNALD
Environmental Management Project

COMPONENT 63 KC-2 WAREHOUSE



FEMP Neg. No. 7036-3

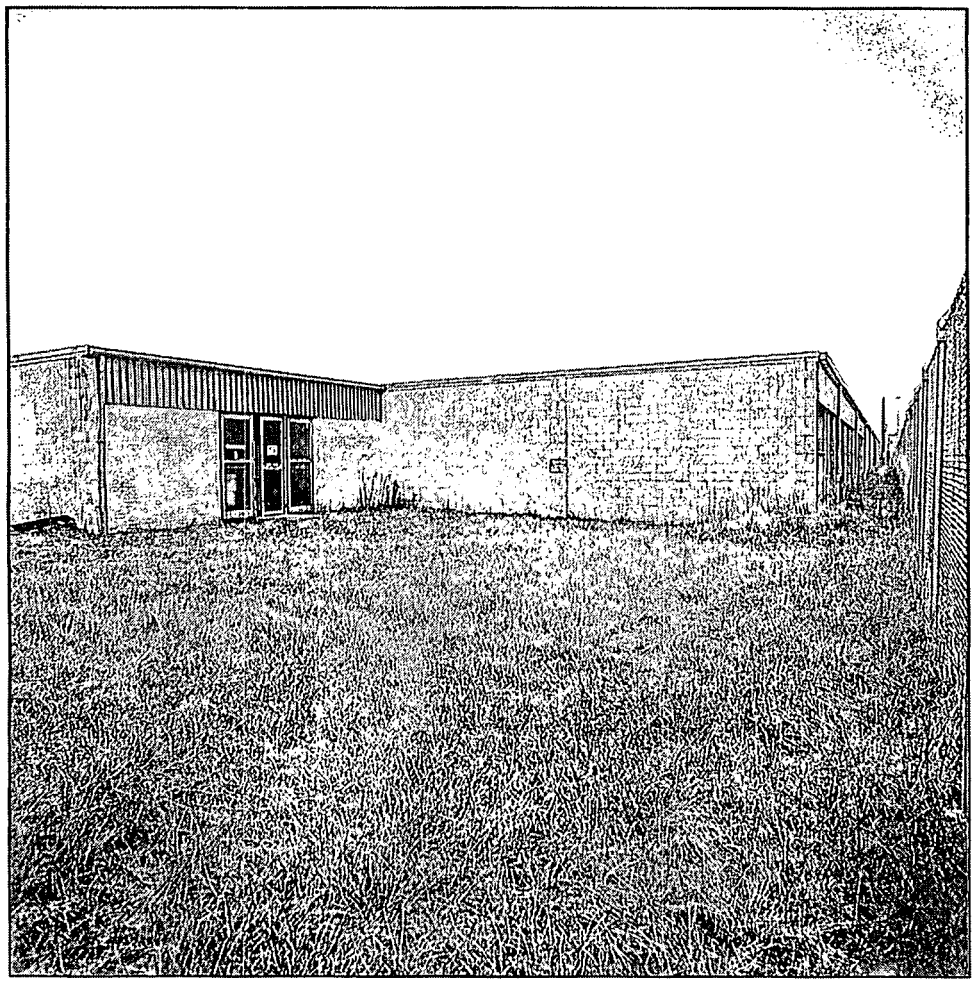


FEMP Neg. No. 7036-2

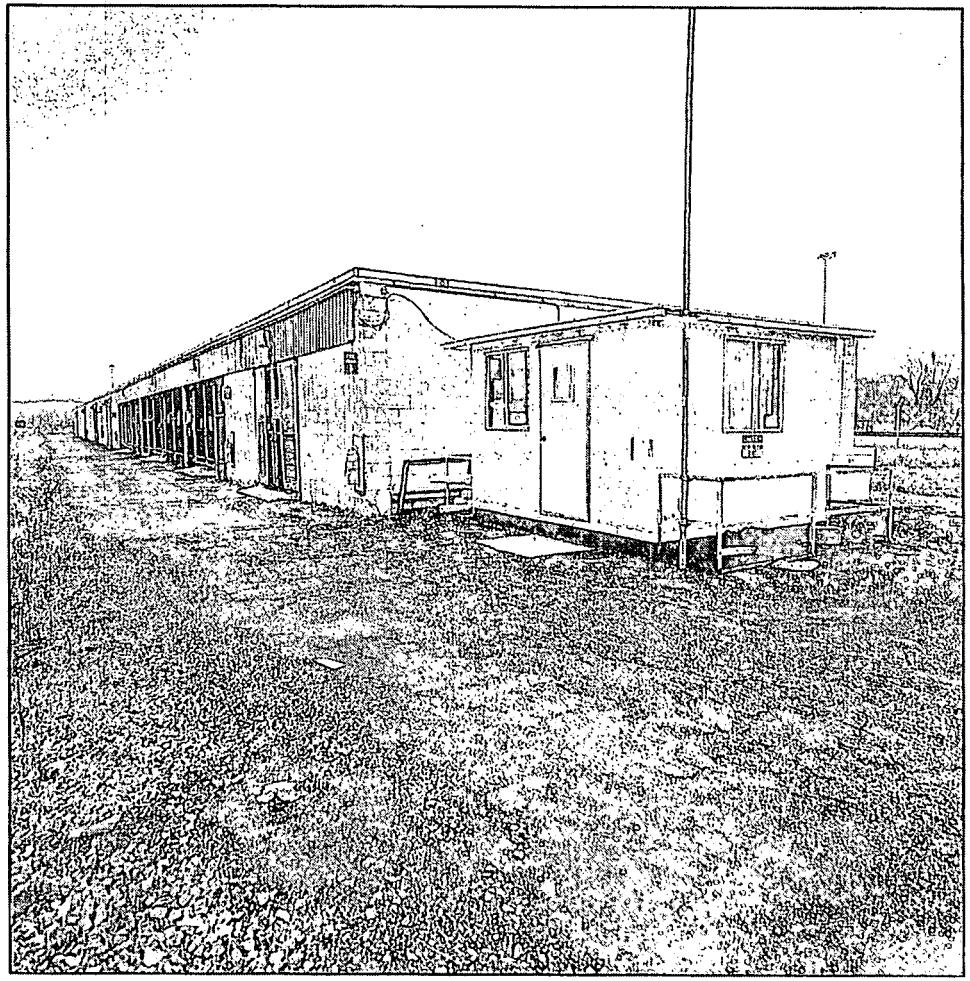
FERNALD
Environmental Management Project

392

COMPONENT 63 KC-2 WAREHOUSE



FEMP Neg. No. 7036-9



FEMP Neg. No. 7035-8

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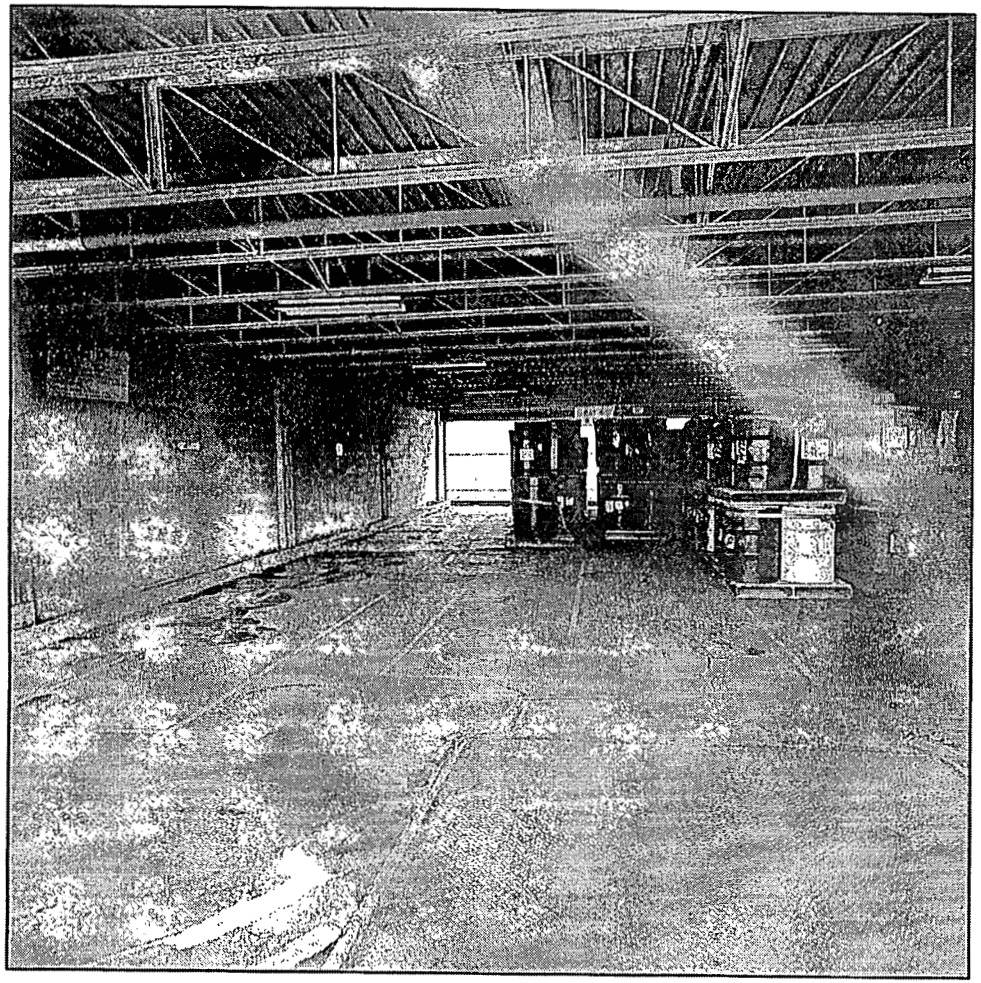
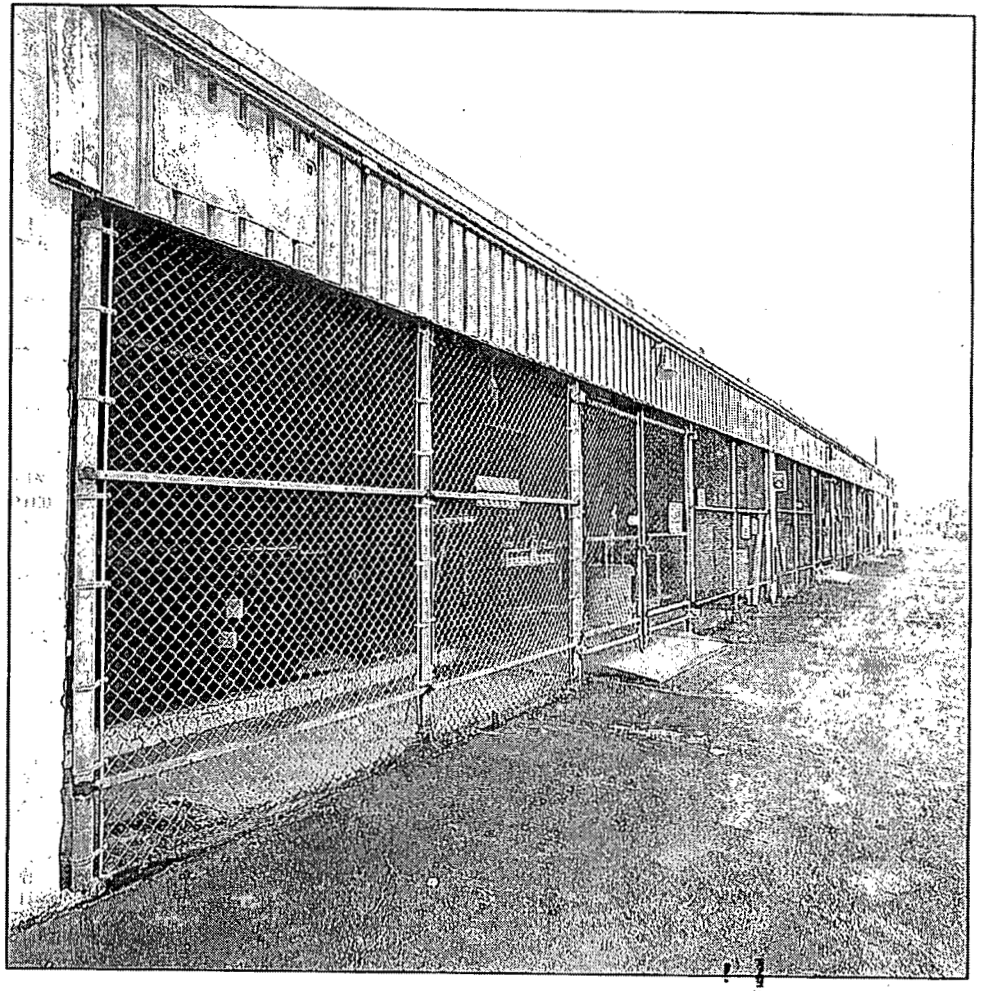
COMPONENT 63 KC-2 WAREHOUSE



FEMP Neg. No. 7036-7



FEMP Neg. No. 7036-4

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